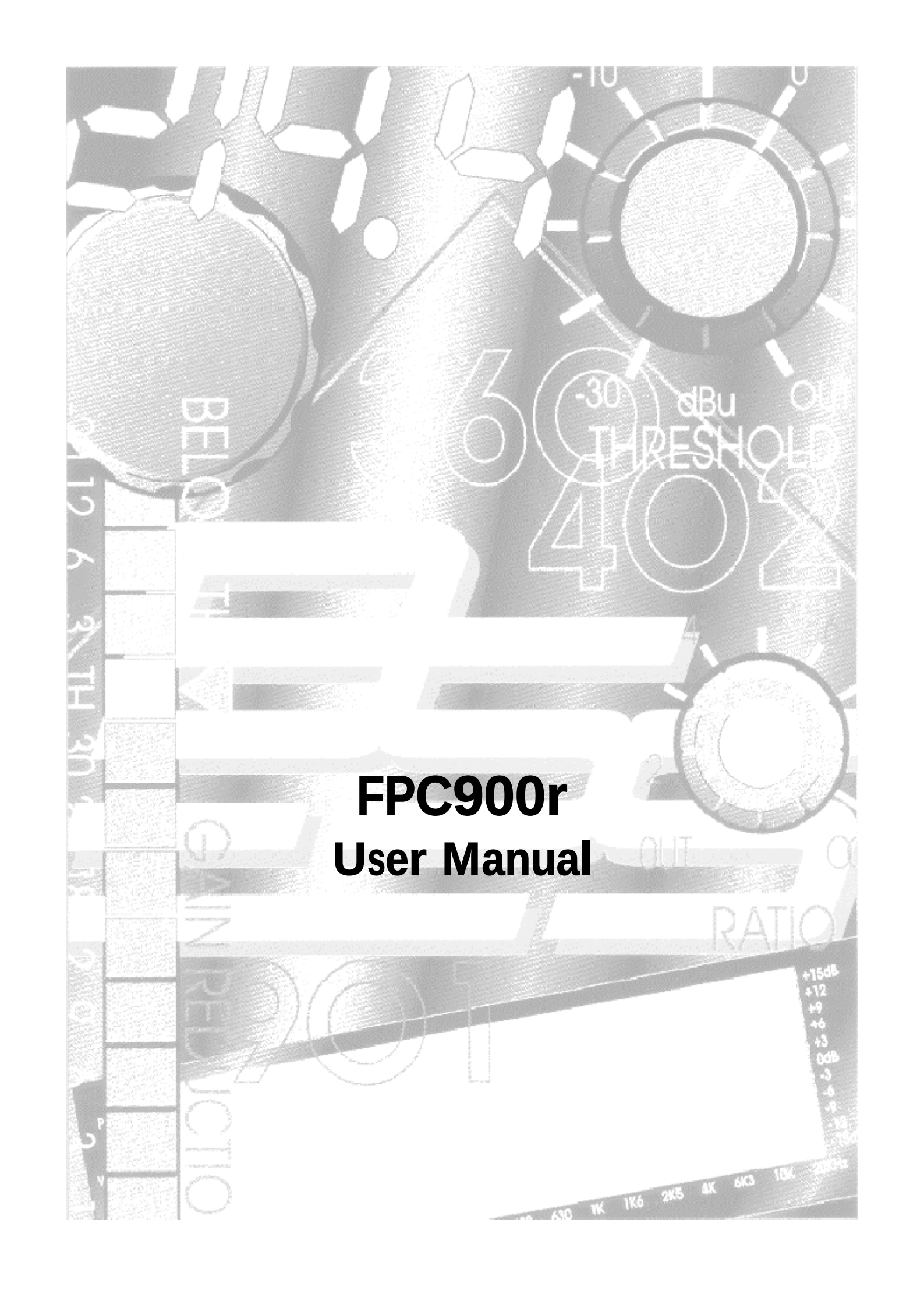




FPC900r

User Manual

CE This equipment has been tested and found to comply with the following European Standards for Electromagnetic Compatibility:

Emission Specification:	EN55013	(1990)	(Associated equipment)
Immunity Specification:	EN50082/1	(1992)	(RF Immunity, Fast Transients and ESD)
Mains Disturbance:	EN61000/3/2	(1995)	

For continued compliance ensure that all input and output cables are wired with cable screen connected to Pin 1 of the XLR. The input XLR Pin 1 on BSS equipment is generally connected to chassis via a capacitor to prevent ground loops whilst ensuring good EMC compatibility.

We have written this manual with the aim of helping installers, sound engineers and consultants to get to grips with the **FPR-900r** and obtain its maximum capability.

If you are new to BSS products, we recommend that you begin at the start of the manual. If, however, you are already familiar with the intended application, and just want to get the unit installed without delay, then follow the highlighted sections.

We welcome any comments or questions regarding the **FPR-900r** or other BSS products, and you may contact us at the address or World Wide Web site given in the warranty section.

Quick Start - Quick Reference

- 1 Check the Mains Voltage setting on the rear of the 900i Interface Unit and install into a rack. Connect the mains to the 900i and check that the unit powers up. All the front panel leds will flash on and off momentarily. Switch off 900i mains power.

Refer to Sections 2.0 thru 2.6 'Installation'

- 2 Connect the Midi Out of the FPC-900i to the Midi In of the first FCS-926/920 or FDS-388 device.
- 3 Connect the Midi Out of each FCS-926/920 or FDS-388 device to the Midi Input of the next in the chain.
- 4 Connect the Midi Out of the last FCS-920/926 or FDS-388 device in the chain to the Midi In of the FPC-900i Interface. This creates a Midi loop through all of the Varicurve devices.
- 5 Change the Midi Channels on the devices to different numbers (their order is unimportant).
- 6 Change the MIDI XMIT on all FCS-926 and FDS-388 devices to be MIDI THRU.
- 7 Connect the FPC-900i Interface to the FPC-900r Remote using the supplied 5pin XLR to 5pin XLR "umbilical cable".

Refer to Section 2.7 'Installation' - Data Connections and Midi.

- 8 Power up the FPC-900i Interface again. The Remote should now come on with a message detailing the version number of the installed software.
- 9 Press the UTILS key. Select XFER with the speed strip.
- 10 Select DATA AREA and turn the BOOST/PARAMETER control until the box reads DUMP.
- 11 Select SOURCE and turn the BOOST/PARAMETER control until the box reads ALLDEV. The DEST box should now read REMOTE.
- 12 Select START. The remote will ask "ARE YOU SURE?" Select YES to continue. All program data from the FCS-920/926 devices will be copied into the remote. (The FPC-900r Remote must be connected to the FPC-900i Interface by the umbilical link for XFER to work.)

Refer to Section 15.0 'Transfer (XFER)'.

- 13 Exit UTILS by pressing UTILS again.
- 14 To select a device for editing, press one of the numeric Device keys.

Refer to Section 4.0 'Selecting a Device'

- 15 To adjust filter parameters press the Speed Strip beneath the frequency of interest to assign a filter (or select an existing one). You can then use the three parameter control knobs to adjust the filter.

Refer to Section 5.0 'Selecting and Adjusting Filters'

Please Read Overleaf...

Using This Manual

Please Read This! - Using This Manual

This manual has been written to make the understanding and operation of the FPC-900 Remote as easy as possible. Because the FPC-900 is a relatively sophisticated software product, we have included several ways to find the information you require in this manual, some of which are new. You will have already found a Quick Reference on the previous page to get the user going from scratch. These instructions are by no means all there is to know and references are made to the main body of the manual for extra detail.

Table of Contents The Contents now begins on Page 3, opposite this one. The chapter and section names are generally those of the important Keys and Controls on the Remote. This is a good place to find whole sections, for example Events or Recall.

Quick Reference Once you have found the appropriate chapter there is often a Quick Reference section. This will give abbreviated instructions for the use of the key or control. These can remind the user of a control's operation if the section has already been read.

"Refer to:" Throughout the text there are references to other areas in the following form.

Refer to Section 3.1 'Basic Controls' - Display.

These will help to tie together different places where the same keys are used for different purposes. They are also used heavily in Section 3.0 'Basic Controls'....

"Section 3.0 Basic Controls" Section 3.0 has several drawings of front and rear panels of both the remote and the Interface. Each are annotated and reference to the appropriate letter will give a brief description of the item and usually a reference to the section in the manual where the item is detailed at greater length.

Index Finally, when you need to refer to a particular feature quickly, the Index may be the quickest way. The Index can be found at the end of the manual, after the appendices.

Please feel free to give us your comments on this manual and any ideas you may have for further improvement. Although we make every effort to ensure that this manual is correct, there may have been recent improvements made in the software which are not reflected in this release.

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1.0 Introduction

The FPC-900 is a portable, wireless remote controller for the FCS-926 and FCS-920 Varicurve Equaliser units and the FDS-388 Omnidrive PA controller. It offers sound engineers and contractors unparalleled flexibility and efficiency in the calibration and control of distributed array systems, and programmable multiband parametric EQ for up to 32 audio channels.

Communicating via a supplied multiway cable, a standard radio-mic link or an XLR tie line, the FPC-900 allows the operator to address a network of up to 16 FCS-926/920 Dual VARICURVE Equaliser Analyser units and FDS-388 Omnidrive PA controller and crossover units from anywhere in an arena, stadium or installation venue.

The intuitive control surface provides familiar rotary control of EQ and RTA parameters in real time with instant selection of functions via a unique Speed Strip touch pad.

The FPC-900 can control all of the features of the VARICURVE units and, in addition, can Group several VARICURVE units to be controlled simultaneously.

The FPC-900 can control the gain, mute and delay variables within an FDS-388 Omnidrive controller.

For show time, an Events system can command user-defined sequences of Midi program changes mapped to VARICURVE Equalisers or other non-BSS Midi controlled equipment such as effects processors and routing matrices.

Installation

2.0 Installation

2.1 Unpacking As part of BSS Audio's policy of quality control, this product is carefully checked before packing to ensure flawless appearance and that it reaches you in first class condition.

After unpacking the two units, please inspect them for any physical damage. If any damage has occurred, notify your dealer immediately. A written claim for damages can then be initiated. The Warranty at the end of the manual gives more information (**see section 18.0**).

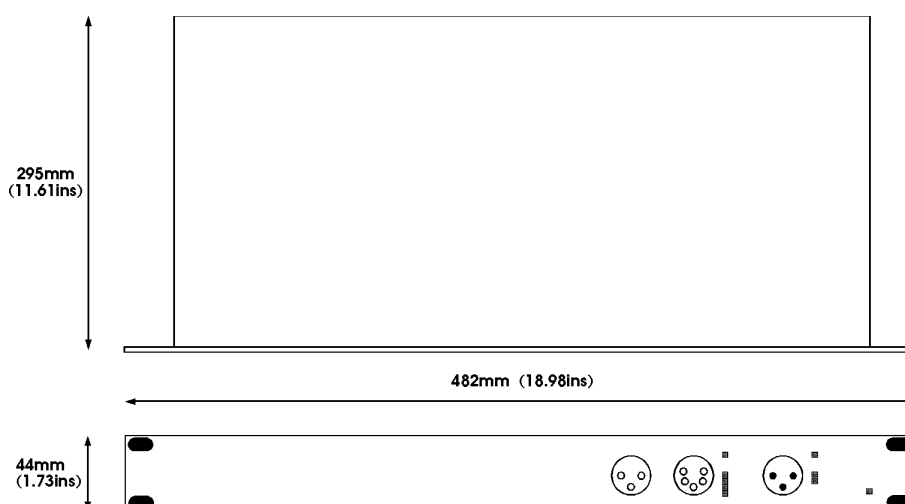
Please retain the shipping carton and all the packing materials for use should the unit need to be transported or returned for any reason.

2.2 Mechanical Requirements The FPC-900i interface requires a vertical rack space of 1U (1.75" or 44mm). The unit should be supported at its rear by additional bracing or shelving if it is to be used in a transportable system. Failure to do so will impair the reliability and may possibly invalidate the warranty. **Figure 2.1** details the relevant dimensions and fixing centres for the FPC-900i.

Adequate ventilation must be provided by allowing sufficient space around the sides and rear of the FPC-900i to ensure free circulation of air. Forced cooling is not required.

The FPC-900r remote is intended to be portable and has no particular mechanical requirements. Care should be taken to ensure that the remote is properly cushioned in transit. The unit should be kept in the carry case provided and transported securely to prevent movement and heavy impacts. **Figure 2.2** details the overall size of the FPC-900r.

Fig 2.1 Overall dimensions of the FPC-900i Interface



2.3 Mains Power

Before connecting the FPC-900i interface to an AC power source, check that the voltage selector switch on the side panel is correctly set. If a change is necessary then ensure that the mains fuse is changed for one of the correct current rating

Refer to Section 2.6 'Installation' - AC Power and Fusing.

WARNING! THIS APPLIANCE MUST BE EARTHED.

IMPORTANT: The wires in the mains lead are colour coded in accordance with the following code.

Green and Yellow.....Earth

Blue.....Neutral

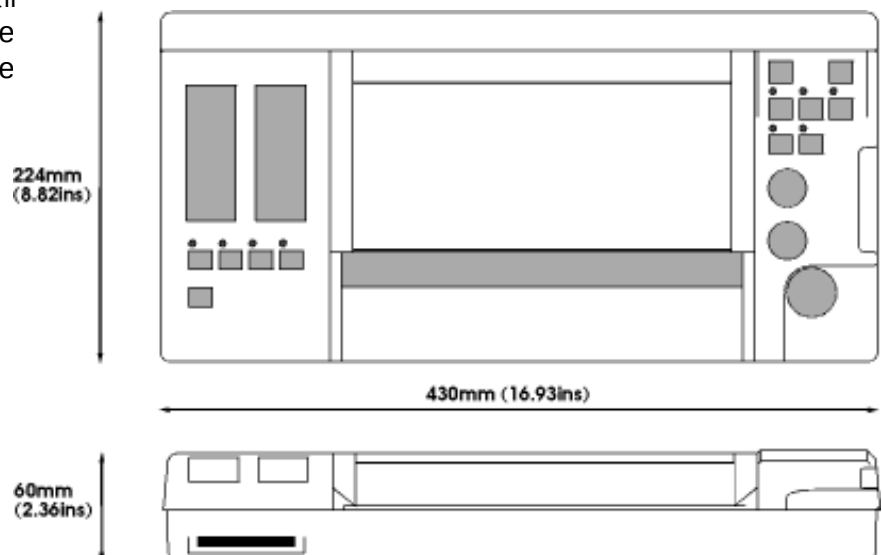
Brown.....Live

As the colours of the wires in the mains lead may not correspond with the markings identifying the terminals in your plug, proceed as follows.

- ① The wire which is coloured Green and Yellow or Green must be connected to the terminal which is marked with the letter 'E' or by the Earth signal  or which is coloured Green and Yellow or Green.
- ② The wire which is coloured Blue must be connected to the terminal labelled 'N' or coloured Black or Blue.
- ③ The wire which is coloured Brown must be connected to the terminal labelled 'L' or coloured Red or Brown.

Those units supplied to the North American market will have an integral moulded 3 pin connector which is provided to satisfy required local standards.

Fig 2.2 Overall dimensions of the FPC-900r Remote



Voltage Setting

Safety Earthing

AC Power Fusing

- 2.4 Voltage Setting** The mains voltage selector switch provides a simple external adjustment to allow operation on all international AC power standards. Newer units are supplied with 115/230V selector switches. The allowable ranges for the supply voltage are:
- 90VAC up to 132VAC on the 120V or 115V position and
190VAC up to 264VAC on the 240V or 230V position.
- Outside these voltages the unit will not work satisfactorily, if at all. Voltages in excess of the maximum will probably cause damage. Voltages below the minimum will cause the power supplies to drop out of regulation, degrading the performance of the system. The battery pack in the remote will preserve all data in the event of a power failure.
- 2.5 Safety Earthing** The Green and Yellow wire of the mains cord must always be connected to an installation Safety Earth or Ground. It is essential for personal safety as well as the correct operation of the system, and is internally connected to all exposed metal surfaces. Any rack framework into which this unit may be mounted is assumed to be connected to the same grounding circuit.
- 2.6 AC Power Fusing** The incoming mains power is fused within the FPC-900i by the fuse holder mounted on the rear panel. Should it be necessary, the fuse must be replaced by one of the same size and current rating.
- 20mm T200mA for the 240V or 230V setting
20mm T315mA for the 120V or 115V setting
- It is most important for continued safety that this specification is strictly adhered to. Spare fuses of the correct rating are supplied with the unit from new.
- It is unlikely that the AC fuse will fail during normal use and caution should be exercised if it does. The most likely reason at first power up is the incorrect setting of the mains voltage switch on the side panel. Another reason may be the connection of the unit across two lines of a three phase supply. In both of these cases the internal transient suppressors may have been damaged and will continue to blow replacement fuses, even if the supply is now correct. The suppressors will have protected the FPC-900i from damage and need replacing before the interface can be used again. **Refer to section 19.1** for the replacement procedure.

2.7 Data Connections and Midi

Quick Reference

Connect MIDI Outs to MIDI Ins in a daisy chain back to the Interface. Set FCS-926s and FCS-920s to different MIDI channels, and set FCS-926s to MIDI XMIT THRU. Connect the Remote - Interface umbilical then execute UTILS/XFER/DUMP ALLDEV to REMOTE.

The 5-way XLR umbilical cable which normally connects the FPC-900r remote to the FPC-900i interface provides power for the remote, charges the internal lead-acid battery, and provides two-way communication. Data emanating from the remote is passed on by the interface to the MIDI Out socket for distribution to the various BSS devices. The remote also requests data back from the devices so that updated parameter values can be checked to eliminate the chance of a communications error causing a difference between what is displayed on the remote, and what is active on the device. For this to happen, the remote must be able to talk to any device, and any device must be able to talk to the remote. This is achieved by the Varicurve equalisers and Omnidrives operating in a 'soft thru' mode, where any received data is passed on to the MIDI Out, but if the device is required to talk, it can do so by injecting data into the stream.

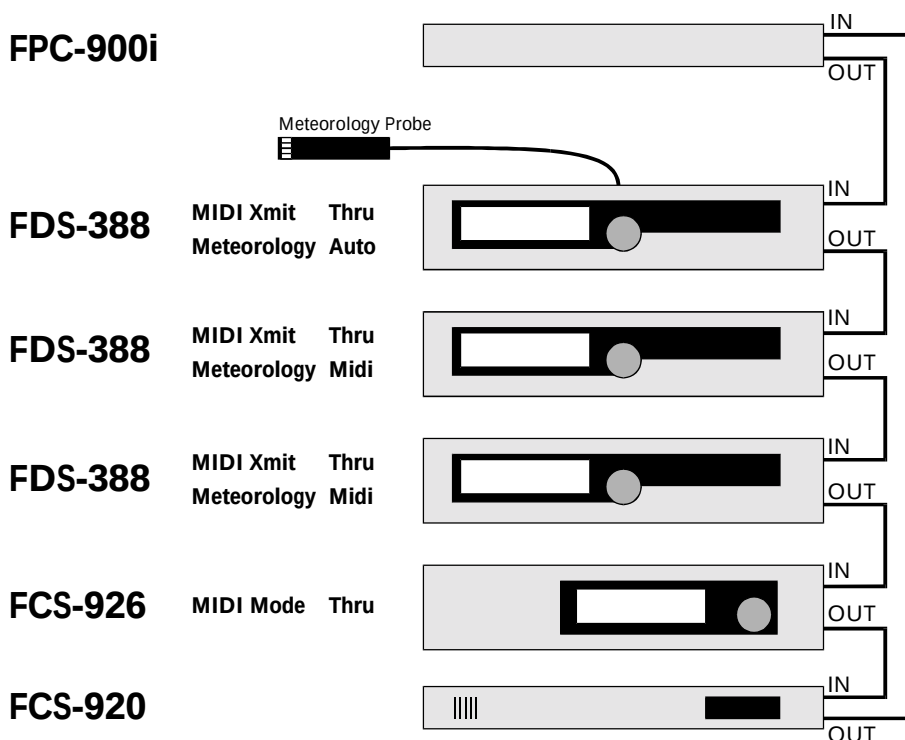
Figure 2.3 shows how multiple units should connect together on a MIDI loop. Connect MIDI Out of the FPC-900i Interface to the MIDI In of the first device, then MIDI Out to MIDI In etc to all the remaining devices in a daisy chain. Connect the final MIDI Out back to the Interface MIDI In. Set all the devices to different MIDI channels, and set their MIDI XMIT mode to THRU. Connect the 5-way umbilical cable between the remote and interface. When power is applied to the system, the display of the remote will energise, and a startup message will appear. If a meteorology probe is used on an FDS-388 Omnidrive then it should be connected to the first FDS-388 in the loop after the FPC-900i MIDI Out. Set the METEOROLOGY variable on the FDS-388 to METEOROLOGY AUTO on the unit fitted with the meteorology probe and to METEOROLOGY MIDI on the following FDS-388s on the loop.

Data Connections

Midi

Since the remote stores within it all data concerned with each Varicurve unit, it is first essential to dump all data from the Varicurves to the remote. Data for Omnidrives is only stored in the Omnidrive itself. To initiate this process, use XFER ALLDEV to REMOTE in the UTILS menu - **see section 15.0 'Xfer (transfer)'**. This must be done whenever any device in the system is added, removed or adjusted in any fundamental way, such as changing the channel access mode. The automatic device polling which occurs invisibly to the user collects current parameters from the currently selected device, but does not collect program data or configuration information, so the user should not be complacent and expect the remote to follow any changes made to the device without its knowledge. Rather, the controls on the Varicurve devices should be left alone once a dump is done, and then use only the controls on the remote to alter the device settings. In 'panic' situations though, the system will tolerate filter parameters being adjusted on the device controls, which the remote will get to know about on the next poll, which occurs approximately every 10 seconds.

Fig 2.3 FDS 388, FCS 920 and FCS 926 used in a Remote Control System



Up to three series-connected 6m umbilical cables may be connected together to extend the radius of operation before power losses become a problem. With a heavier cable however, the cable length may be increased. A four-core screened cable with 0.5 square mm conductors will allow a length of up to 50m to be used. If a greater distance is required, then use the FSK communications (**see section 2.8**) and the internal battery.

2.8 FSK An FSK (Frequency Shift Keying) communications channel is included for operation over long microphone cables, or over a standard musicians wireless link. One-way data transmission is then possible, although the user may notice that the lower data rate results in slower reaction of the devices to commands issued by the remote.

Using standard microphone XLR cable, lengths of several hundred metres are quite acceptable. A wireless link however allows not only a greater operating range, but also more freedom since it is not necessary to drag cables around. The signal level from the remote is around 0dBu, compatible with the guitar input of a wireless transmitter. The FSK input of the interface will accept a similar signal level, although any signal level which lights the SIG LED, but does not light the PEAK LED will be acceptable. If this is not the case, then adjust the signal level from the receiver to suit. If the ERROR LED lights, then the signal may be too noisy or intermittent.

Internal Battery

2.9 Internal Battery

Quick Reference

Connect the umbilical between the remote and interface so that the charger can keep the battery charged. Any flashing LEDs on the interface indicate charge to go. All four LEDs light when fully charged. Keep the display brightness lower when working remotely via FSK, and always re-charge immediately after.

The battery in the FPC-900r remote is a lead-acid type designed for long life, when subjected to proper charge cycling. Unlike Nickel-cadmium cells, lead-acid batteries will tolerate frequent light discharges. The shallower the discharge, the more the life will be improved. The battery charger in the FPC-900i interface is an intelligent processor controlled charger which takes care of the battery charge management transparently to the user. Leave the umbilical connected to the energised Interface all the time the remote is in use if possible. Only disconnect it when FSK communication is essential, and then only for as long as necessary. As soon as FSK is finished with, put the remote back on charge. You cannot overcharge the battery since the interface stops charging when the battery is fully charged. The CHARGE LEDs on the interface show the charge progress. On an exhausted battery, all four will flash.

As the battery charges, the CHARGE bargraph will 'fill-up' with lit LEDs, while the top ones flash to show charge to go. When the battery is fully charged, all four LEDs will be on and none will flash. Whilst connected to the interface, the battery bargraph meter on the remote will show the same charge progress as the interface. When the remote is working on battery power, the battery meter shows life remaining, which are not the same. If the FAULT LED should light on the interface, then this could indicate either a battery malfunction, or that the fuse inside the remote has ruptured.

When working remotely via FSK, the battery is the only source of power. The main consumer of power in the remote is the display backlight, so to preserve life, the display brightness should be kept as low as is acceptable. Typically, a freshly charged battery will give approximately 40 minutes of use when the display is at full brightness, whereas at minimum brightness, up to 3 hours can be expected. When the remote is powered from the interface via the umbilical, it is energised continuously, and does not switch off. Under battery power however, the remote is energised by pressing the ON button momentar-

Internal Battery

ily. The unit will remain energised for approximately 30 seconds after which it will switch off automatically, unless a control is moved, which starts the timer for another 30 seconds.

As time progresses, the battery meter will gradually empty, until ultimately, unless the user recharges the battery, the meter will empty, soon after which the display brightness will automatically dim to conserve power, and ultimately the unit will switch itself off so that sufficient charge is retained to keep the internal memory energised.

Never leave the battery in a discharged condition for long periods otherwise the memory contents may be lost, and the battery may suffer irreversible damage. As soon as possible, re-charge the battery. If the remote is to be stored for an extended period, make sure that the battery is fully charged.

Basic Controls

A NUMERIC KEYS

The NUMERIC KEYS have two independent modes, switching automatically as required by the current mode of the Remote.

- 1 As 'Channel keys' to select a device or several devices for display and editing.

Refer to Section 4.0 'Selecting a Device', Section 4.3 'SOLO' and Section 10.0 'Grouping' - GROUP and ALL.

- 2 As 'Alphanumeric keys' for entering text when storing programs or naming devices and events.

Refer to Section 6.1 'STORE' - Naming Programs and Section 14.4 'Events' - Index with Events.

B SPEED STRIP

The Speed Strip is a linear controller which allows the user to select filters and menu items with finger presses. Its mode of operation varies with screen mode.

- 1 When the display is scrolled down, showing the top status bar and an EQ curve, the Speed Strip will select between filters. The chosen filter is denoted by a vertical cursor of dots.

Refer to Section 5.1 'Selecting and Adjusting Filters' - Speed Strip

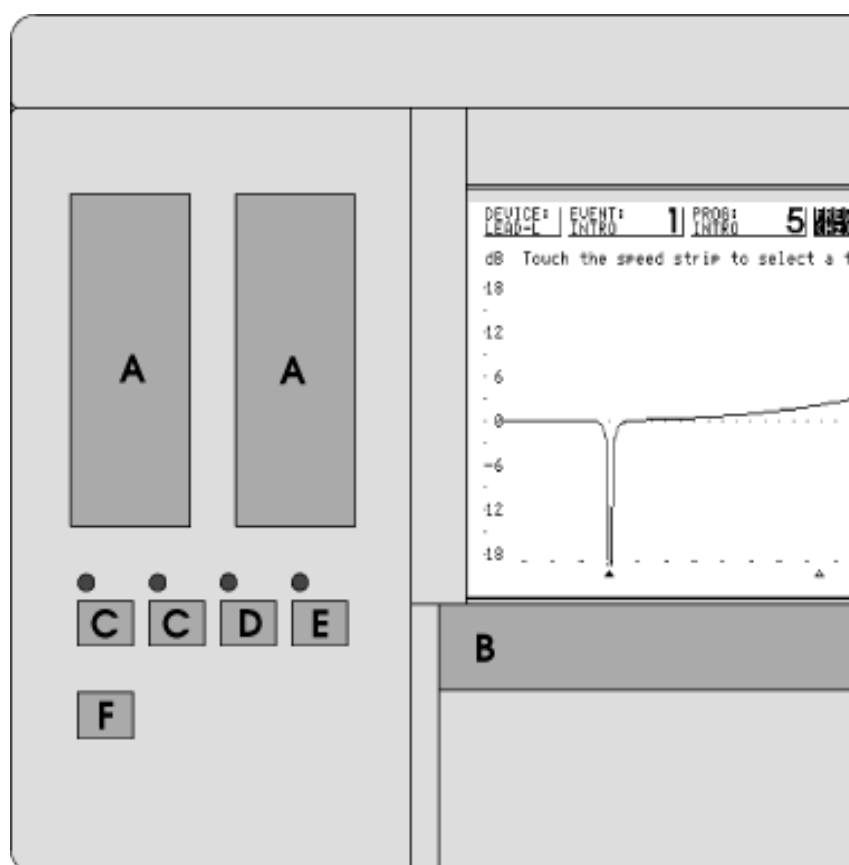
- 2 When the display is scrolled up, showing a selection menu along the bottom edge of the screen, the Speed Strip will select between the menu items available.

Refer to Section 9.0 'Utilities'

C GROUP and ALL

The GROUP key allows several devices (or their individual audio channels) to be combined and adjusted simultaneously. Controls available to the group include group muting and bypass in addition to the standard filter controls. The ALL key works in conjunction with the Grouping system to put all available devices into a group.

Refer to Section 10.0 'Grouping' - GROUP and ALL



D SOLO

SOLO allows the user to listen to individual devices or audio channels. Several channels can be selected to be heard simultaneously - all unselected devices and audio channels are muted.

Refer to Section 4.3 'Selecting a Device' - SOLO

E EVENT

The EVENT system allows the user to trigger combinations of program changes across all linked Midi devices with a single command. A maximum of 50 Events are available in the FPC900r each

of which can be programmed with a different program change for each Midi device. The FPC900r Event system will send program changes to any equipment connected by Midi and so can be used for the control of any Midi equipment whether or not manufactured by BSS. Events can be triggered

from the Speed Strip or the Event key in the Event Select menu.

Refer to Section 14.0 'Events'.

F INDEX

The INDEX key will list index information related to the current display.

1 Selecting INDEX while in normal filter adjust mode will provide a display of devices along with their user defined names. The names can be edited and a new device selected from here.

Refer to Section 4.0 'Selecting a Device'

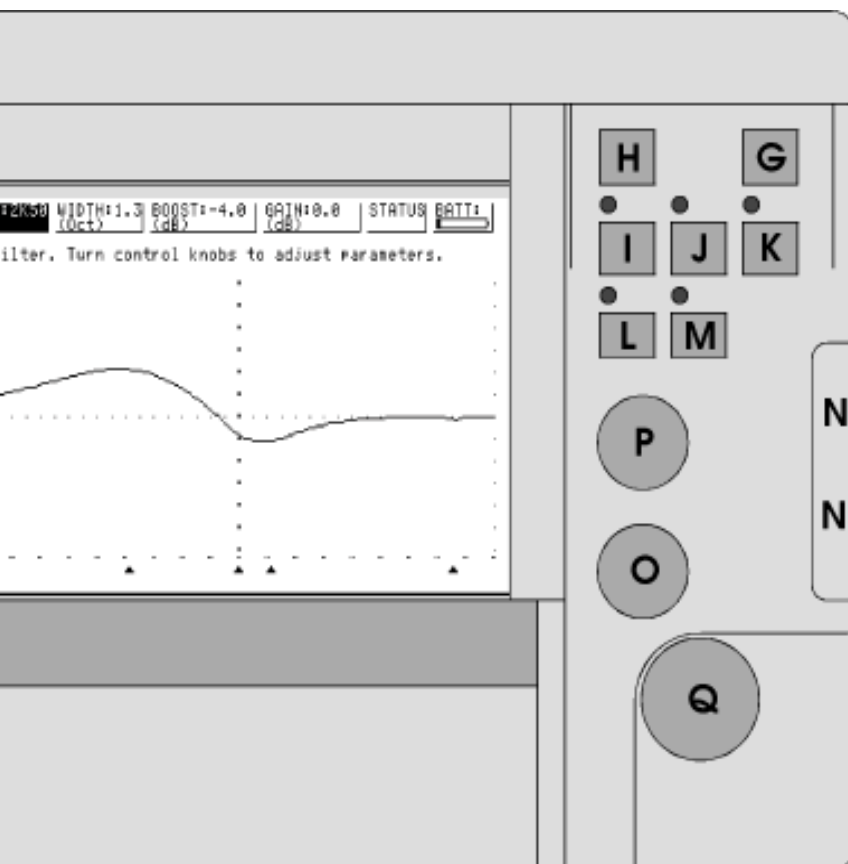
2 Selecting INDEX whilst storing, recalling or comparing programs will display a list of all programs available on the current device.

Refer to Section 6.2 'STORE' - INDEX in Store mode.

Refer to Section 7.1 'RECALL' - INDEX in Recall mode.

- 3** Pressing INDEX whilst in the Event Select menu will display a list of all Events available with their names.

Refer to Section 14.0 'EVENT'



Basic Controls

G ON/CHECK

When the Remote is connected to the Rack Interface (FPC-900i) through the umbilical cable it should be turned on and off at the Rack Interface unit using the Mains switch. When the Remote is powered by its internal battery it will go into 'sleep' mode 30 seconds or so after the last key press or control change. Press the ON/CHECK switch to turn the Remote back on. Pressing the ON/CHECK while the remote is powered up will cause all the connected Varicurve equalisers to flash a response message ("Receiving.." on FCS-926 and FDS-388, "...." on FCS-920). This gives a fast method of checking the integrity of midi connections. If the communications link is complete the remote will also show the message "*****RECEIVING*****".

Refer to Section 2.0 'Installation'.

H FLAT

Press the FLAT key momentarily to hear the chosen audio channel with no equalisation. A second press returns the previous EQ. Pressing and holding the FLAT key will permanently flatten the chosen channel.

Refer to Section 5.7 'Selecting and Adjusting Filters' - FLAT.

I STORE

Use STORE to save the current EQ program along with a user defined name.

Refer to Section 6.0 'STORE'.

J RECALL

Use RECALL to recall a previously stored EQ program.

Refer to Section 7.0 'RECALL'.

K COMPARE

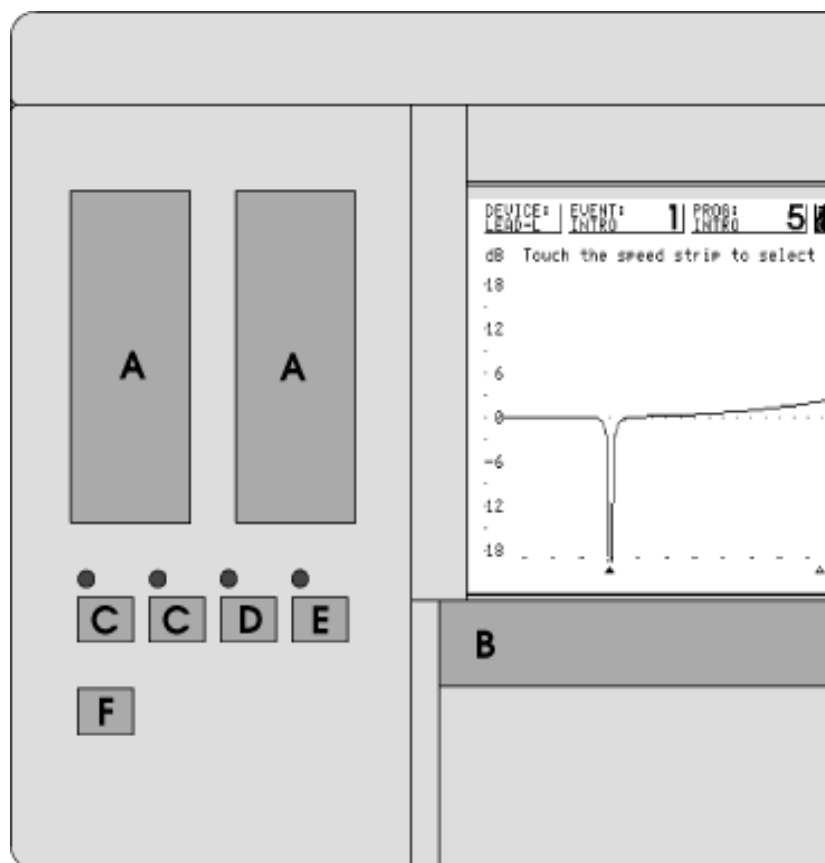
Pressing the COMPARE key will allow the user to browse through the stored EQ programs hearing the effect of each, in turn, on the current audio channel.

Refer to Section 8.0 'COMPARE'.

L UTILS

Pressing UTILS will scroll the display upwards to show a menu of set-up and device control items. The items are selected using the Speed Strip and then adjusted with the BOOST/PARAMETER control.

Refer to Section 9.0 'Utilities'



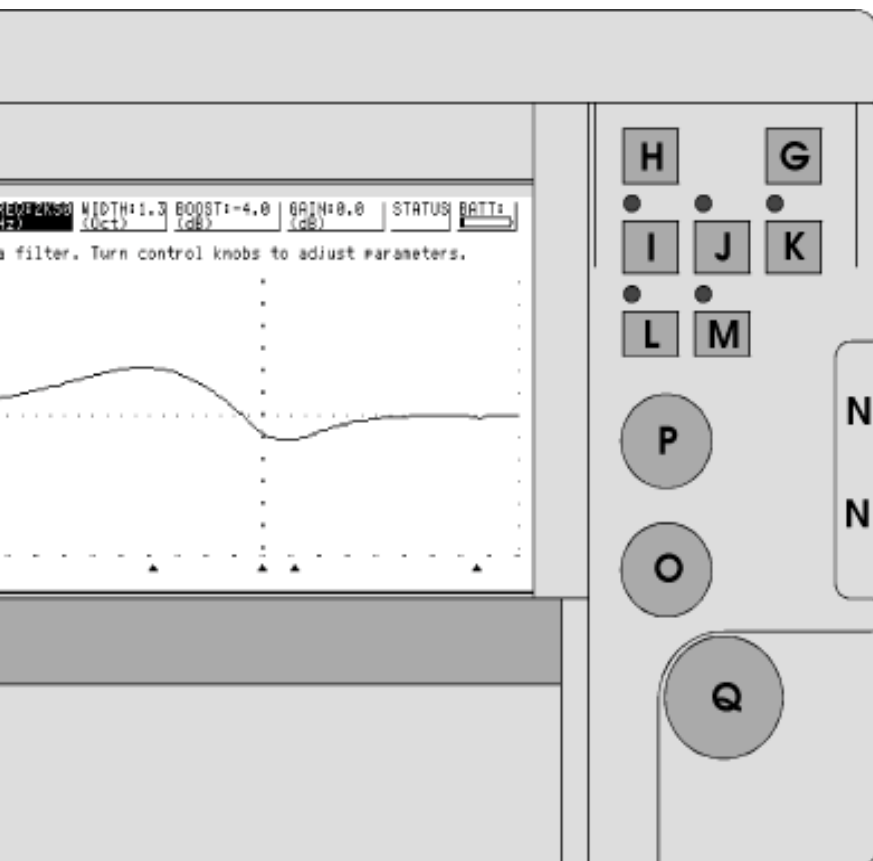
M RTA (Real Time Analyser)

Pressing RTA will scroll the display upwards to show a menu of RTA control items.

Refer to Section 11.0 'RTA (Real Time Analyser)'

N CONTRAST & BRIGHTNESS

These two controls allow the user to adjust the contrast and brightness of the display to suit viewing conditions.



O WIDTH

The WIDTH control will adjust the bandwidth of the currently selected filter.

P FREQUENCY

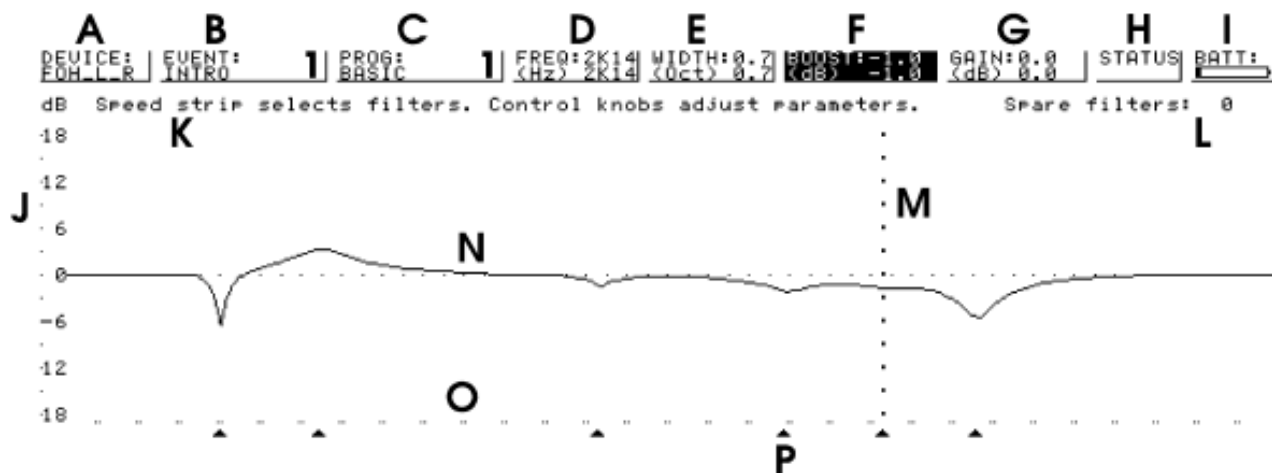
The FREQUENCY control will adjust the frequency of the currently selected filter.

Q BOOST/PARAMETER

The BOOST/PARAMETER control is primarily used to adjust the boost and cut value of the currently selected filter. When the UTILS or RTA menus are displayed or when data entry is required on the screen, the BOOST/PARAMETER adjustment becomes a general purpose data entry control. Turning the control will increment and decrement a value or step through a series of options.

Refer to Section 5.5 'Selecting and Adjusting Filters' - Filter Adjustment

Varicurve Display

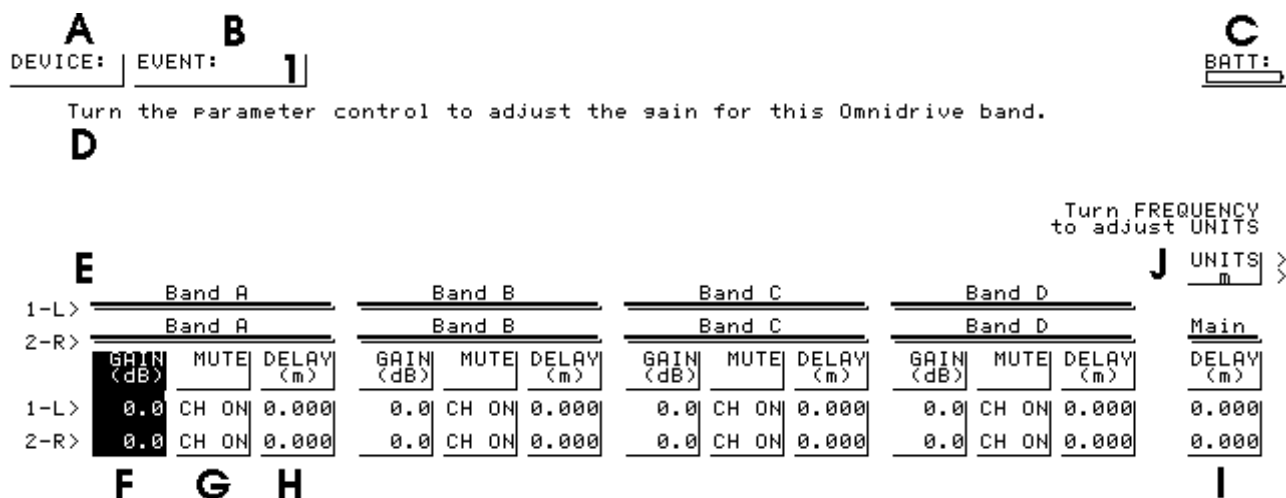


3.1 Varicurve
Display

DEVICE NAME	A	User-defined name for each of the 16 available devices. Refer to Section 4.2 'Selecting a device' - INDEX. This box will display " - - GROUP - - " when Group mode is selected.
LAST TRIGGERED EVENT	B	This is the name and number of the last triggered Event. Refer to Section 14.0 'EVENT'.
PROGRAM	C	This is the name and number of the current program on this device. The program number will shrink in size if the program has changed since it was recalled. Refer to Section 7.0 'RECALL'.
FREQUENCY	D	
WIDTH	E	
BOOST	F	These display the filter parameters of the currently selected filter. The upper value is for channel 1 in a dual device, the lower is for channel 2. In Stereo, both are displayed; in Mono on the upper value is used. Refer to Section 5.0 'Selecting and Adjusting Filters'.
GAIN	G	This box displays the gain value, or values, for the currently selected device. Refer to Section 9.2 'Utilities' - Gain.
DEVICE STATUS	H	This box displays the current status of the selected device. It will only display the most important status message at any time. In order of priority, from most important to least, the messages are; LOCKED, SHOWTM, GROUP, VIEW, BYPASS, MUTED, PKFIX and MONO.

BATTERY	I	This box gives a graphical representation of the battery charge available if the remote is being operated using its internal battery. See Section 2.9 'Installation' - Internal Battery.
dB SCALE	J	This vertical scale displays the cut and boost values for the equalisation contour across the centre of the screen. The whole screen can be shifted up or down to see peaks or notches using the VSCROL utility. Refer to Section 9.2 'Utilities' - VSCROL.
ON-SCREEN HELP	K	There are two display lines devoted to on-screen help. When the upper status bar is on the screen, the help text will appear in the line below the status bar. If one of the lower menus is in use, the help text will appear just above the menu. The help text will change to represent the current screen or item selected. The help text details the most important options available from the current position.
FILTERS AVAILABLE	L	This is the number of filters available in the currently selected device. Usable filters are those which have a cut or boost value of 0dB. If a filter has its cut/boost reduced to 0dB, its marker will disappear and the Filters Available value will increase by one. Available filters can be positioned by touching the Speed Strip at the required frequency position and adjusting the cut/boost control.
CURSOR	M	The cursor represents the current filter's Frequency position. Selecting VIEW ON Refer to Section 9.2 'Utilities' - VIEW will change the cursor and allow the user to move the cursor along the display checking the cut/boost value of the curve or curves at each of the 210 frequency points.
EQUALISATION CURVE	N	The curve, or curves, across the screen are a precise graphical representation of the frequency response of the current Varicurve device.
FREQUENCY SCALE	O	The dot marks across the bottom of the EQ display represent the 30 frequencies labelled on the speed strip. These are the frequencies used in the Real Time Analyser display. Refer to Section 11.0 'RTA'.
FILTER MARKER	Q	Each of the triangular markers represents a filter that has a cut or boost value associated with it. These filters can be selected for adjustment by touching the Speed Strip at the marker position. Refer to Section 5.1 'Selecting and Adjusting Filters' - Using the Speed Strip.

Omnidrive Display



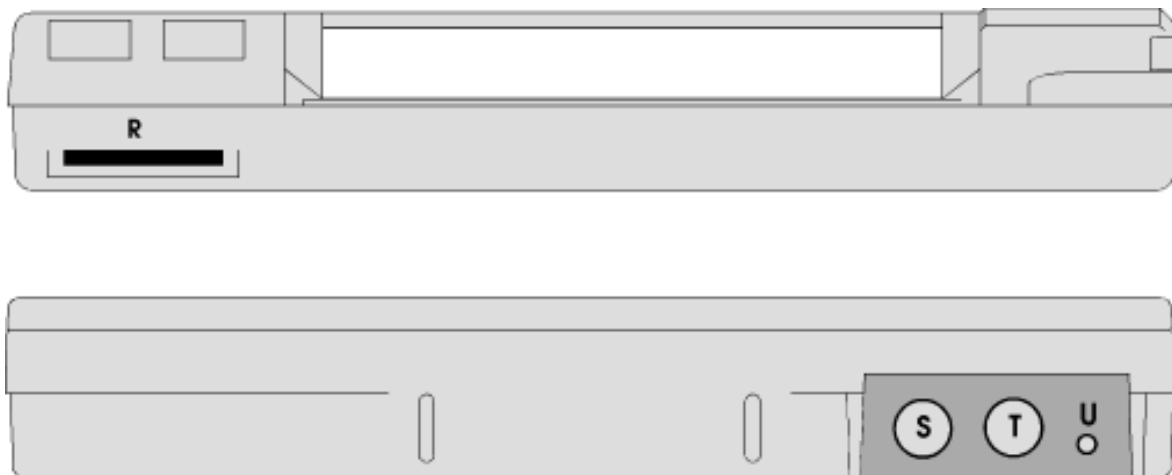
3.2 Omnidrive Display

- DEVICE NAME** **A** User-defined name for each of the 16 available devices. **Refer to Section 4.2 'Selecting a device' - INDEX.** This box will display " - - GROUP - - " when Group mode is selected.
- LAST TRIGGERED EVENT** **B** This is the name and number of the last triggered Event. **Refer to Section 14.0 'EVENT'.**
- BATTERY** **C** This box gives a graphical representation of the battery charge available if the remote is being operated using its internal battery. **See Section 2.9 'Installation' - Internal Battery.**
- ON-SCREEN HELP** **D** The help text will change to represent the current screen or item selected. The help text details the most important options available from the current position.
- BAND NAMES** **E** The two band names are displayed with the names as set on the Omnidrive unit. The left name is at the top, the right name is at the bottom. **Refer to Section 17.0 'Controlling Omnidrive Devices'.**
- GAIN** **F** This box displays the band gain value, or values, for the currently selected device. **Refer to Section 17.0 'Controlling Omnidrive Devices'.**
- MUTE** **G** This box displays the band mute status for the currently selected device. **Refer to Section 17.0 'Controlling Omnidrive Devices'.**

DELAY	H	This box displays the band delay value, or values, for the currently selected device. <i>Refer to Section 17.0 'Controlling Omnidrive Devices'.</i>
MAIN DELAY	I	This box displays the main delay value, or values, for the currently selected device. <i>Refer to Section 17.0 'Controlling Omnidrive Devices'.</i>
UNITS	J	This box displays the local delay units for the currently selected device. This is not the same units as on the device itself. <i>Refer to Section 17.0 'Controlling Omnidrive Devices'.</i>

Remote Connections

3.3 Remote Connections



PCMCIA2 Smart Card Slot

R

The front panel PCMCIA2 card slot allows the storage of data from the remote onto memory cards of any size from 256k to 2Mbyte.

Refer to Section 16.0 'Smart Card'

Remote Interface

S

This 5 pin female XLR connector is used for the umbilical cable connection between the FPC-900i interface and the FPC-900r remote.

RTA Input

T

This 3 pin female XLR connector is intended to be used with a calibrated microphone as the input for the internal RTA and SPL meter.

Refer to Section 9.3 'Utilities' - More Sub-Menu and Section 11.0 'RTA (Real Time Analyser)'.

FSK Output

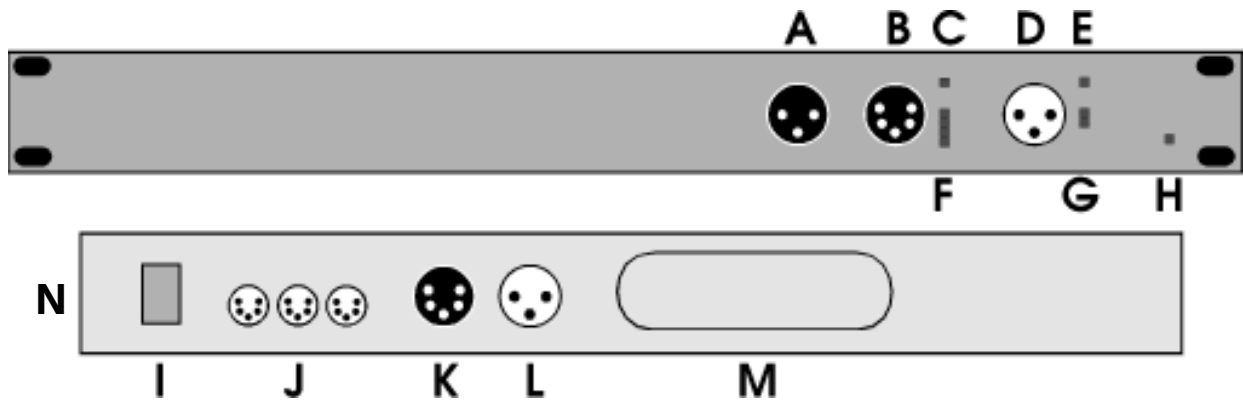
U

This 0.25in jack socket can be used as an output to a radio transmitter when the umbilical link to the remote interface is not connected. Data will be passed in one direction allowing the control of Varicurve devices over a wireless link.

See Section 2.8 'Data Connections and Midi' - FSK.

Interface Controls and Connections

3.4 Interface Controls and Connections



PINK NOISE OUTPUT

A

The FPC-900i pink noise output can be turned on and off from the remote. Press UTILS and select MORE or press RTA. The menu item named PINK will turn the noise output on and off. The pink noise output level is approximately +1dBu. **See Section 9.3 'MORE Sub-menu'.**

REMOTE INTERFACE

B

This 5 pin connector carries the power and data link to the Remote using the supplied multicore cable. This connector is wired in parallel with the connector labelled REMOTE INTERFACE on the rear panel (See 'M'). **Refer to Section 2.7 'Data Connections and Midi'.**

FAULT LED

C

This led indicates a charging fault with the Remote internal battery. The interface cannot charge the battery due to disconnection or a battery fault. There is also a protection fuse on the battery circuit within the Remote. **Refer to Section 2.9 'Internal Battery'.**

FSK INPUT

D

This 3 pin socket is a Frequency Shift Keying (FSK) data input from the remote. This connector carries control data from the remote to the interface through a standard audio cable or wireless link. Note that this data is one way only. No data is returned from the controlled Varicurve units to the remote. This connector is wired in parallel with the connector labelled FSK INPUT on the rear panel (See 'L'). **Refer to Section 2.8 'FSK'.**

ERROR LED

E

This led indicates an error in the data received on the FSK input. Possible causes are loss of transmission if a radio link is in use, or insufficient signal level, noise or interference.

Interface Controls and Connections

CHARGE LEDS	F	These leds indicate the percentage charge in the Remote battery when the remote is connected using the multicore umbilical cable.
SIGNAL and PEAK LEDS	G	These leds indicate the signal level of the audio signal on the FSK data input from either the front or rear panel connectors. The wireless system receiver gain should be adjusted so that the green SIGNAL led lights permanently but the red PEAK led does not.
POWER LED	H	This led indicates that the mains power is connected and on, and that the interface power supply is functioning.
MAINS POWER SWITCH	I	
MIDI IN, THRU AND OUT	J	<i>See Section 2.7 'Data Connections and Midi'.</i>
REMOTE INTERFACE	K	This connector for the multicore link to the remote is wired in parallel with the REMOTE INTERFACE connector on the front of the interface unit.
FSK INPUT	L	This connector is for FSK data input and is wired in parallel with the FSK INPUT on the front of the interface unit.
OPTION PANEL	M	A removable panel is included to allow the fitting of control option ports.
VOLTAGE SELECTOR	N	<i>Refer to Section 2.4 Voltage Setting</i>

4.0 Selecting a Device

Quick Reference

Press a Device key to select an individual device or channel.

Press both Device keys on the selected device to change a device from Dual to Stereo, or from Stereo back to Dual.

4.1 Device Keys



The 16 pairs of Device keys on the left hand side of the Remote are used to select between the devices connected to the system. The key numbers - from 1 to 16 - relate directly to Midi Channel numbers. Think of the Device keys as 'steering' the controls and display to any device or channel.

If a Varicurve device is in Stereo or 12 band Mono mode, pressing either of the Device keys will select that device. In Dual channel mode each of the Device keys will select one of the two Varicurve channels in a device. **Refer to section 17.0** for information on controlling the FDS-388 Omnidrive.

Note: Pressing a Device key will cause a Response message to be displayed on any devices connected to that Midi channel.

Each Varicurve device can be changed between Mono, Dual and Stereo modes from the remote.

Mono Only the left hand channel led will be lit in Mono mode. Up to 12 filters are available for adjustment. The STATUS box at the top right of the screen will show MONO unless a higher priority message is being displayed. Switching a device to and from mono can only be done by selecting the UTILITY menu and adjusting the MONO item. **Refer to Section 9.2 'Utilities'.**

Dual and Stereo In these modes each channel has six filters available. Dual mode allows the two channels in a single device to be adjusted independently of each other. Linking them in Stereo causes the filters in each channel to track the corresponding filters in the other channel. In Stereo, both channel curves are displayed together.

To switch between Dual and Stereo simultaneously press both of a device's Device keys. Both of the device channel leds will be lit in Stereo mode.

INDEX SOLO

4.2 INDEX Pressing the INDEX key displays a directory of all the device numbers. Each entry corresponds to a Midi channel. The entry displays the type of device connected to the Midi channel, which mode it is in and its user defined name or names. To select a device to edit or to change its user name either:

INDEX



- Press the corresponding Device Key or
- Choose SELECT on the menu with the Speed Strip and turn the parameter control to move the highlight cursor.

Pressing a device Device key when it is already highlighted will select the device to be the current device.

To edit the selected device or channel name, choose NAME on the menu and enter a new name using the Device keys. Each key will enter the character printed next to it. To enter a character that is printed within a square box press the Shift key (bottom left corner of the Device keys) and then press the second Device key adjacent to the required character. There is no Enter or Return key to finish - all characters entered go straight into the device name.

To edit another name, choose SELECT on the Speed Strip and move to another device by pressing its Device key.

Pressing INDEX a second time will leave the Index screen.

Fig. 4.1
Index screen

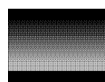
1	FOH-L-R	926	Stereo
2	DELAY	926	Stereo
3	???		
4	???		
5	???		
6	???		
7	???		
8	???		
9	TCS-804A	???	
10	TCS-804B	???	
11	???		
12	???		
13	???		
14	???		
15	???		
16	???		

Use the channel keys to enter an alpha numeric name for the selected device.

SELECT NAME DONE

4.3 SOLO SOLO allows one or more channels to be heard individually. **Solo will not work when viewing an Omnidrive device, nor can the user solo an Omnidrive device**

SOLO



Pressing SOLO once will start the Solo led flashing. At this time no muting will have taken place. If one of the Device keys is pressed, all channels except the selected channel will be muted. Channels can now be added to, or removed from, the solo selection by pressing their Device keys. To leave Solo press the SOLO key again. All device channels will return to their original mute status. The pattern of soloed channels is NOT stored on leaving Solo. Returning to Solo will require channels to be selected again.

Pressing GROUP while there are channels soloed will create a group comprising the solo channels.

Refer to Section 10.0 'Grouping - GROUP and ALL' for more details on groups.

Selecting and Adjusting Filters Using the Speed Strip Status Bar Boxes

5.0 Selecting and Adjusting Filters

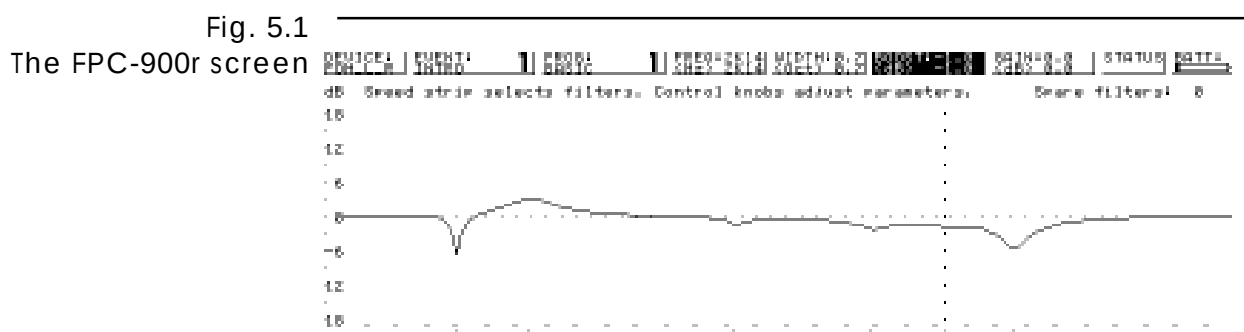
Quick Reference

- 1 Select a filter to adjust by pressing the Speed Strip.
 - 2 Adjust the filter using the Frequency, Width and Boost/Cut knobs.
 - 3 Press and hold FLAT to clear an equalisation curve.
-

5.1 Using the Speed Strip. The speed strip is a linear controller used in conjunction with the filter graphics and text menus displayed on the lcd screen. Most of the time the speed strip is used to select a filter to adjust or to create a new filter at a desired frequency. **(Refer to Section 9.0 'Utilities' to find details on the menu selections.)**

The screen display **(See figure 5.1)** shows the 900r display ready to edit filter parameters. The arrow heads along the bottom of the screen mark the positions of existing filters for this device. There are a maximum of 6 filters when the device selected is in Stereo or Dual modes and a maximum of 12 filters in Mono. Only the used filters are marked with arrows, a count of spare filters (filters set to zero cut or boost) being displayed at the top right of the display, just below the battery indicator. The filter selected for editing is marked with a cursor made up of a row of dots down the screen.

5.2 Status bar boxes. Along the top of the display in the Status bar are three boxes which continuously show the parameters for the current filter; frequency, width and cut/boost. Each box can display two values - the top values relate to channel one and the lower values to channel two. In Mono mode, or if channel 1 is selected in Dual mode, the filter values are displayed along the top row. If channel 2 is selected in Dual mode, the values are displayed along the bottom row. Both channel values are displayed when in Stereo.



EQ Display

Speed Strip Selection

Filter Adjustment

5.3 EQ Display The current equalisation curve shown on the display should be thought of as being in a scratchpad or working area. A curve can be recalled from a program memory and then adjusted in the working area without altering the stored program memory. If the curve is edited wrongly, the program memory can be recalled again or FLAT pressed to start again. Only when a curve is adjusted correctly in the working area need it be stored into a more permanent program memory.

5.4 Speed Strip selection. Pressing the strip in an area of the curve where there are no filters will move a spare filter to the chosen frequency. The filter values in the status bar change to reflect the new frequency and the cursor moves to the new position. Adjusting the filter Cut/boost using the rotary control will change the displayed curve and a new arrowhead will appear at the bottom of the cursor to mark the filter and the filter adjustment will be sent to the currently selected Varicurve device. If the speed strip is pressed close to a currently used filter marker, that filter will be selected and marked with the cursor. When there are two used filters close together, pressing the speed strip repeatedly near them will step the filter cursor between them alternately.

5.5 Filter adjustment. Each of the three filter parameters has a separate rotary control on the 900r making it even easier and quicker to adjust filters than the FCS-926 Varicurve.

- Turning the FREQUENCY control will move the centre frequency of the selected filter. The exact frequency of the peak or dip is displayed in Hertz (Hz) in the status bar FREQ: box. The adjustment range is from 20.7Hz to 20kHz.
- Turning the WIDTH control will broaden or narrow the selected filter bandwidth. The width of the filter is displayed in octaves (Oct) in the status bar WIDTH: box. Adjustment is from 0.1 to 2 octaves.
- Turning the CUT/BOOST control will increase or decrease the gain of the filter at its centre frequency. The filter cut or boost is displayed in dB in the status bar BOOST: box. The range available is from +15dB down to -15dB. Turning the control past -15dB will change the filter to become a deep notch of around -30dB. The BOOST: status box will indicate 'Notch' in this mode.

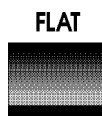
DEVICE: 900r | EVENT: | PROG: | FREQ: 20.7Hz | WIDTH: 0.1 | BOOST: +15dB | STATUS: FATT: |
dB Speed strip selects filters. Control knobs adjust parameters. Clear filters: 0

Make-up Gain FLAT EQ Bypass

- 5.6 Make-up gain Note that the Gain of the current device is not adjusted automatically and so may need to be altered by the user if large amounts of cut or boost are applied.

Refer to Section 9.2 'Utilities' - Gain.

- 5.7 FLAT The FLAT key can be used to temporarily flatten the current equalisation curve for comparison purposes, or to permanently clear it to start from scratch.



A brief press of the FLAT key will clear down the filter values and channel gain allowing the resultant flat eq to be heard on the selected Varicurve. Adjusting any filter parameter - or pressing FLAT again briefly - will return the original equalisation curve.

A longer press of the FLAT key (about one second) will permanently clear the current equalisation from the selected device. The curve is gone forever - unless of course it had been stored. In Dual mode, FLAT will only work on the current channel of a device. In Stereo, both channels will be cleared.

To flatten a single filter, select the filter using the Speed Strip and then, whilst still pressing the strip, select the FLAT key.

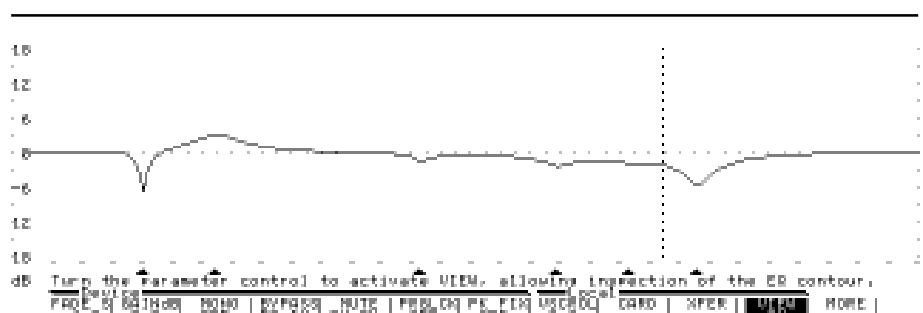
- 5.8 EQ Bypass EQ Bypass on the Varicurve devices can be controlled on the remote from within the Utility menu.

Refer to Section 9.2 'Utilities' - BYPASS.

- 5.9 Examining with VIEW A curve examine mode available on the FCS-926 is also available on the 900r. View is enabled from within the Utilities menu. Press the UTILS key, select the strip under VIEW and turn the parameter control to make the box display 'ON'. The cursor will change as shown **in figure 5.2**. The parameter status boxes now only show the frequency of the cursor and the dB cut/boost value (or values) of the displayed curve at the cursor position. Turning the FREQUENCY control now moves the cursor back and forth along the curve allowing the user to read off the exact boost value at any point.

Refer to Section 9.2 'Utilities' - VIEW.

Fig 5.2
View mode ON



Examining with View Scrolling the Display

- 5.10 Scrolling the display The display can be scrolled up or down to see the peaks or troughs of any heavily boosted curves. The View cursor can be used in conjunction with the scrolled display to read off the values of peaks that would normally be off the screen.

Refer to Section 9.2 'Utilities' - VSCROL.

6.0 STORE

Quick Reference

- 1 Press STORE.
- 2 Turn the Parameter control to select a program number.
- 3 Enter a name, if required, using the numeric keys.
- 4 Press STORE a second time to complete the Store function.



There are 50 program memories available in each Varicurve device, all of which are available at the FPC-900 Remote. Each program memory consists of the filter parameter settings along with the device input gain settings, peak fix status and access mode (Stereo/Mono/Dual).

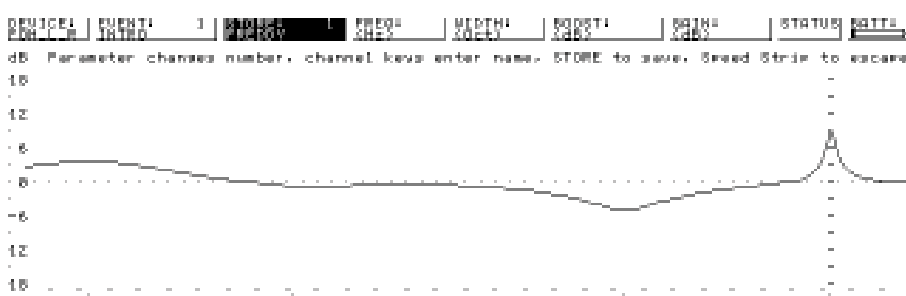
NOTE: Store will not store programs on an Omnidrive device. Omnidrive programs must be stored in the Omnidrive itself.

In addition to the 50 device program memories, there are 12 special program memories within the Remote designed for the storage of Room Curves. These are named R1 to R12 and follow on from program 50. Room Curves are equalisation curves produced from RTA measurements and are a record of the equalisation characteristics of an acoustic environment such as a studio, theatre or concert hall. Room Curves are produced by the Room Curve function in the RTA menu and are used by the Auto EQ function to reproduce the same response in another location. It is also possible to create Room Curves manually and Store them in locations R1-12.

Refer to Section 12.0 - 'Make and Add Curve' and Section 13.0 - 'Auto EQ'.

The first press of the STORE button changes the Program box in the status bar to indicate the destination program number for the current EQ. (See figure 6.1).

Fig 6.1
Storing a program



Naming Programs

INDEX in Store Mode

Turn the Parameter control to choose a program number to Store to. Programs 1 to 50 are device programs. Programs R1 to R12 are intended for Room Curves.

6.1 Naming Programs A new name can be entered using the Device keys. To use the characters in boxes, (!, #, *, etc.) press and hold Shift and then select the relevant Device key.

The second press of the STORE key will complete the process.

To leave the function at any time before Storing the data, press the Speed Strip or select another key.

The user will not be allowed to Store into any program that is locked. Lock is denoted by a key symbol next to the chosen program number in the status bar.

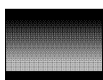
To lock or unlock a program Refer to Section 9.2 'Utilities' - PRGLCK

If AUTOLK is set to PROMPT, the user will be asked whether or not to lock the program after the second press of the STORE key.

Refer to Section 9.3 'MORE Sub-menu' - AUTOLK.

6.2 INDEX in Store mode A full index of the programs already Stored in a device is available by pressing INDEX after the first STORE key press. Adjusting the destination program number will move the cursor along the index. Locked programs are indicated with a key symbol.

INDEX

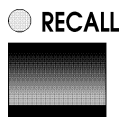


RECALL INDEX in Recall Mode Recalling Between Devices

7.0 RECALL

Quick Reference

- 1 Press RECALL.
- 2 Turn the Parameter control to select a program number.
- 3 Press RECALL a second time to load the EQ into the current device.



RECALL is used to load any of the 50 stored programs within a Varicurve device into the current program and filter hardware. If the user wishes to browse through several stored equalisation programs then please **refer to the Section 8.0 'COMPARE'**.

The first press of the RECALL button changes the Program box in the status bar to indicate the source program number and its associated name. The equalisation display will change to show the equalisation curve stored in the chosen program but the device filters will not be altered at this stage. Turn the Parameter control to choose a program number. As each program is selected, its curve will be displayed.

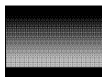
NOTE: *Only those programs which have been stored in the same access mode as the current access mode will be available. The Parameter control will skip over all others.*

NOTE: *Omnidrive programs cannot be recalled from the FPC-900R.*

Once a program has been chosen press Recall a second time. The filters in the current device will then be updated with the equalisation data. The new program number is now displayed in large characters in the Program box in the status bar. If the recalled equalisation is now altered in any way, the program number will change to small characters indicating that the current EQ no longer matches the stored data. Recalling a Room Curve will send new filter parameters to the current Device but not Program changes.

To leave the function at any time before Recalling any data, press the Speed Strip or select another key.

INDEX



7.1 INDEX in Recall mode. A full list of the programs already Stored in the device is available by pressing INDEX after the first press of RECALL. Adjusting the source program number with Index on will move the cursor within the index. Locked programs are indicated with a key symbol.

7.2 Recalling Between Devices To recall a stored program from another device into the current device, press RECALL followed by the Device key for the device from which you wish to copy. You can now choose a program to Recall from the selected device. To finish, press RECALL a second time.

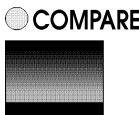
DEVICE: | EVENT: 1 | RECALL: 10 | FREQ: | WIDTH: | ROOM: | DATA: 0 | STATUS: DATA |
PWL: 0 | INTD: | | CH2: | 2000 | 000 | 000 | 0 |
dB Param changes program. RECALL loader. Speed Strip escapes. Device key for source device.

COMPARE
RECALL in Compare Mode

8.0 COMPARE

Quick Reference

- 1 Press COMPARE.
- 2 Turn the Parameter control to listen to each of the available programs.
- 3 Press RECALL to load an EQ into the current device or press COMPARE again or touch the Speed Strip to escape.



COMPARE is intended to allow the user to listen to the effect of each stored equalisation, in turn, on the current audio programme. The current equalisation can be compared with a stored one and the new one Recalled if required.

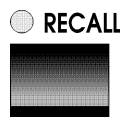
The first press of the COMPARE button changes the Program box in the status bar to indicate the compare program number and its associated name. The equalisation display now shows the previous EQ contour in the form of dots while the browse EQ is shown as a solid curve. The filters in the current device are changed to allow the user to hear the effect of the stored EQ.

Turn the Parameter control to browse through the stored programs 'on-line'.

Only those programs which have been stored in the same access mode as the current access mode will be available. The Parameter control will skip over all others.

A second press of the COMPARE key will turn off the Compare function and return the original EQ. This allows the instant comparison of the sound of a stored EQ with that of the current one by repeatedly pressing COMPARE. This also means that if the current EQ has been changed, it can easily be compared with the original stored version.

8.1 RECALL in Compare mode



If the user wishes to recall the Compared program to the current device, press RECALL. The new program number is now displayed in large characters in the Program box in the status bar. If the recalled equalisation is now altered in any way, the program number will change to small characters indicating that the current EQ no longer matches the stored data.

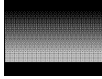
DEVICE: FRONT: 1 | COMPARE: 1 | FREQ: | WIDTH: | BOOST: | GAIN: 0.0 | STATUS: BATT: |
dB Parameter changed program. RECALL loads data. COMPARE again or Speed Strip to escape.

INDEX in Compare Mode

8.2 INDEX in Compare mode

A full list of the programs already Stored in the device is available by pressing INDEX after the first press of COMPARE. Adjusting the source program number with Index on will move the cursor within the index. Locked programs are indicated with a key symbol.

INDEX



WARNING! Since entering the Compare mode allows an on-line browse through previously stored and possibly very dissimilar programs, care must be exercised to avoid system or loudspeaker damage.

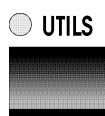
Utilities Menu

9.0 Utilities Menu

Quick Reference

- 1 Press UTILS
- 2 Select a menu item by pressing the speed strip directly below the required item.
- 3 Turn the parameter control to adjust the item value.

9.1 UTILS You will by now have noticed the screen scrolling up to display a menu whenever the RTA or UTILS key is pressed. This ensures that Menu selections only take up screen space when there are options to be set, or for setting up and using one of the many equalisation tools available in the FPC-900r. Some of the more important adjustments in the UTILS menu have already been referred to.



The UTILS menu contains all the basic operating controls of the FCS-926 and FCS-920 Varicurve devices other than the standard filter values. It also contains some of the more useful data handling tools such as the Transfer menu. The following section covers each of these menu items in more detail.

The items available on pressing UTILS are:

- FADE** Adjusts the crossfade time of the Varicurve program changes.
- GAIN** Adjusts the signal gain of the current Varicurve channel.
- MONO** Switches the Varicurve device between Dual and Mono modes.
- BYPASS** Switches the Varicurve device in and out of circuit.
- MUTE** Mutes the output of the current Varicurve channel.
- PRGLCK** This locks a program against being edited.
- PK FIX** Locks the peak values of filters to prevent filter interaction.
- VSCROL** Scrolls the equalisation display up and down.
- CARD** Enters the CARD Menu.
- XFER** Transfers data to and from the Varicurve devices and the remote.
- VIEW** Enables the user to read level values directly from the eq curve.
- MORE** Accesses the UTILS sub-menu.
Selecting MORE on the main UTILS menu takes the user through to a secondary menu. This contains the following:
- AUTOLK** This selects whether or not a program is locked when Stored.
- MICSEN** Sets an input sensitivity level for a calibrated microphone.

dB Turn the parameter control to adjust crossfade time. Haptic to menu.

- PINK** Turns the interface pink noise output on and off.
- LOKOUT** Locks out various controls on the Remote to prevent tampering.
- MORE** Returns to the main UTILS menu.

9.2 Action of Utilities

Following each menu item name is the area of the system that it applies to. These area references are duplicated in the bar across the top of the menu items. Items marked Channel will affect the Varicurve device currently selected. Items marked Remote will only affect the remote or its interface.

- FADE** Pressing a Device Key will change the currently selected channel whilst keeping the same Menu and Item selected on the screen.

(Channel) [Adjust value -6.0S to +6.0S]

FADE adjusts the crossfade time of the Varicurve program changes.

Positive fade time is the time taken for one EQ contour to be faded down and the replacement contour faded up. Negative fade time will merge from one EQ contour into the new one. Cross fading only applies to program recall.

- GAIN** (Channel) [Adjust value -12dB to +12dB]

This item adjusts the overall gain of the current Varicurve channel.

Adjust the input gain from -12dB to +12dB in 0.5dB steps. When an EQ is stored into a program memory this gain value is also recorded. In stereo mode, both channels are adjusted simultaneously whilst keeping any gain offset between them constant.

When extreme EQ contours have been set, it may become necessary to restore the correct operating level by adjusting input gain.

- MONO** (Channel) [ON, OFF]

This selects the configuration of the filters within a Varicurve device.

With MONO set to ON, all 12 filters are assigned to Channel 1. With MONO OFF the filters are split between two 6 filter sets.

When MONO is OFF, use the Device keys to select whether the device is in Dual or Stereo modes.

Refer to Section 4 'Selecting a Device' to read more about switching between Stereo and Dual modes.

Programs stored in any one of these modes will not be available for recall if the device is switched to a different mode.



Utilities Menu

BYPASS (Channel) [EQ IN, EQ OUT]

Bypass switches the Varicurve device in and out of circuit.

With EQ IN the device is in circuit. With EQ OUT the EQ circuitry is bypassed by a relay ensuring signal flow even with the power off. This control affects both channels within a 920 or 926.

MUTE (Channel) [CH ON, MUTED]

Mutes the output of the current Varicurve channel.

Select between CH ON representing 'Channel On' and MUTED representing 'Channel Off'.

(Channel) [OFF, ON]

PRGLCK This selects the control and adjustment lock out on individual programs.

Selecting ON ensures that the currently selected Program memory is protected and cannot be overwritten. Selecting STORE while Program Lock is on will confirm the protected status by displaying a PROGRAM LOCK warning menu. If PRGLCK is set to ON or AUTOLK in the UTIL Sub-menu, the remote will prompt whenever a program is Stored as to whether the user requires the program to be locked or not.

PK FIX (Channel) [OFF, ON]

Select between ON and OFF. Selecting ON instructs the internal control circuits to record each filter's boost or cut value and hold the peak constant while other filters are adjusted. The consequence of this is to minimise the interaction effect on a filter when an adjacent one is adjusted. Note that if one channel only is peak fixed and the two channels are subsequently stereo linked, then peak fixing will remain on one channel only. If peak fix is changed in stereo mode however, both channels peak fix status will change together.

Operation of the peak fix option may cause the display redrawing to slow.

VSCROL (Remote) [Adjust value -16dB to +16dB]

This allows the horizontal 0dB axis of the screen to be scrolled up and down. Adjusting this value will shift the display up or down allowing large filter peaks or notches to be viewed more easily.

CARD (Remote)

Selecting CARD will access the Smart Card Menu.

Refer to Section 17.0 'Smart Card'



Utilities Sub-menu

XFER (Remote)

Selecting XFER will access the Menu containing options linked with transferring program data through the Midi port or over the FSK link.
Please refer to Section 16 - 'Data Transfer'.

VIEW (Remote) [OFF, ON]

This enables the filter VIEW mode. VIEW is a contour viewer allowing the parameter control to move the cursor from one end of the display to the other. The Frequency value in the status bar will give the position of the cursor while the boost/cut reading gives the level of the contour at the cursor position. In VIEW mode the filters cannot be adjusted and so this gives a basic protection to the contour data on the display.

MORE Selecting MORE will access the second utilities sub-menu.

9.3 MORE sub-menu MORE is a sub-menu containing less used Utilities and is entered by selecting MORE after pressing the UTILS button.

AUTOLK (Channel) [OFF, AUTOLK, ON]

With AUTOLK selected the remote will prompt the user whether to Lock or Unlock a program whenever it is Stored. This will allow the user to Store programs Locked rather than having to go back and Lock them later. With ON or OFF selected all programs will be stored either Locked or Unlocked respectively. When the user attempts to Store into a locked program a warning will be displayed on the screen.

MICSEN (Remote) [2mV to 20mV in 0.5dB steps]

This adjusts the sensitivity of the analyser microphone input. It should be adjusted to the value supplied on the analyser microphone data sheet.

PINK (Remote) (OFF, ON)

This item turns the FPC-900i interface pink noise output on or off.

LOKOUT (Remote) [UNLOCK, SHOWTM, LOCKED]

This selects various levels of control and adjustment lock out on the remote unit.

With this item set to LOCKED the remote will not allow any changes to be made to a device from the remote. When SHOWTM is selected programs can be recalled and events actioned but neither can be stored to. With it set to UNLOCK the remote will operate normally.

MORE Returns to the UTILS menu.



Grouping
GROUP

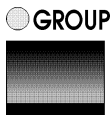
10.0 Grouping - GROUP and ALL

Quick Reference

- Press ALL or GROUP.
- Use the Device Keys to enter channels into, or remove channels from the Group.
- Adjust the available filters in the normal way.
- Press UTILS to access the Group mute and gain.

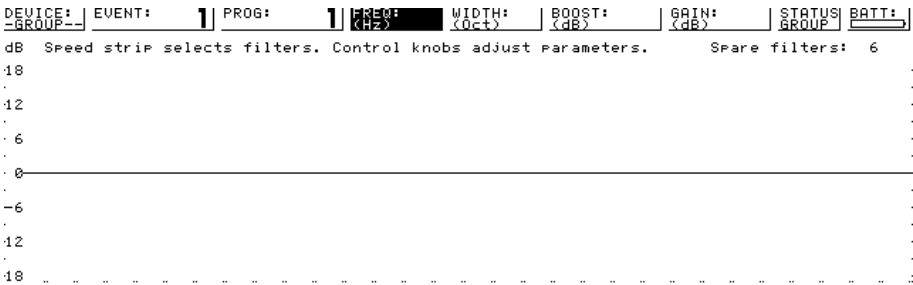
The Group functions - GROUP and ALL - on the FPC-900r allow the user to adjust filters on a collection of Varicurve channels simultaneously. In addition to the standard three filter parameters there is also access to a Group Utils menu allowing Muting and Gain control across a selected Group. Because the filter parameters of Varicurve channels can be very different when they are grouped, the FPC-900r has to decide which filters to link together from the various devices. The boxed section on page 39 details the precise rules followed in Grouping filters.

10.1 GROUP Pressing GROUP will prepare a Group containing the last used selection of Varicurve channels. Either six or 12 filters are available in Group depending on the access of the members of the group. If all the group members are mono then 12 filters will be available. The remote will attempt to assign as many filters as possible from each member to the Group filters. The decisions used in assigning the filters are covered on page 39.



Once the GROUP led is on, the Device Keys are used to flip channels in and out of the group. The channel leds will indicate the members of the group. The assigned group filters are marked with triangles along the bottom of the screen in exactly the same way as for an individual channel. Spare filters are numbered in the top right corner of the

Fig 10.1
Group mode



GROUP Group UTILS

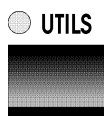
screen. See fig 10.1. The Group curve is always displayed as flat on entry, representing a starting point for all the members of the group. An adjustment made to the group curve will be made to all channels that have appropriate filters available.

NOTE that the relative differences between the parameter values of the group members are always preserved. This means that if a one member of a group reaches a limit whilst a parameter is being adjusted, no further adjustment can be made to the group parameter in that direction.

If a channel led is flashing it indicates that that channel does not have a filter at, or near the frequency of the selected group filter. Adjusting the group filter will have no effect on that channel. To make an adjustment at that frequency on the whole group would require a spare group filter. The speed strip can be used to select another of the group filters, or to select a frequency to position one of the spare filters. Spare group filters are only available if all members of the group have spare filters.

Pressing GROUP a second time will turn off the Group mode and return the user to an individual channel. The combination of group members is stored for the next time that group is used.

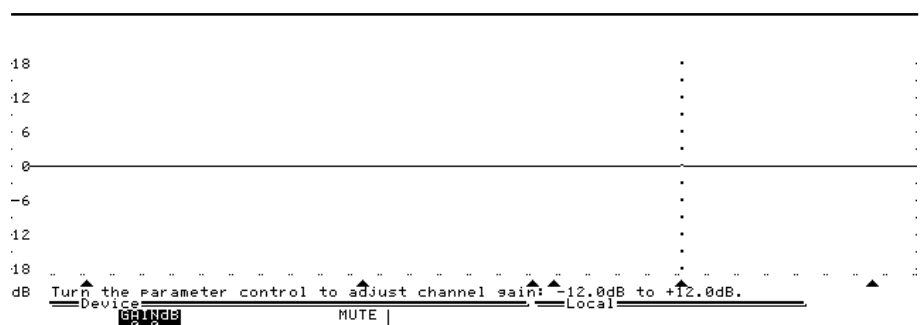
10.2 Group UTILS Pressing UTILS whilst in GROUP mode will bring up a Group version of the utilities menu. Only two items are available here - Gain and Mute. Select one and adjust using the parameter control. See fig10.2.



NOTE that because the Mute information is transmitted as a Gain value, a change in Gain will not be displayed by a FCS-926 if the channel is muted. Always adjust the channel Gains with the channel on.

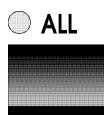
Press UTILS again to return to the group filter display.

Fig 10.2
Group UTILS



ALL

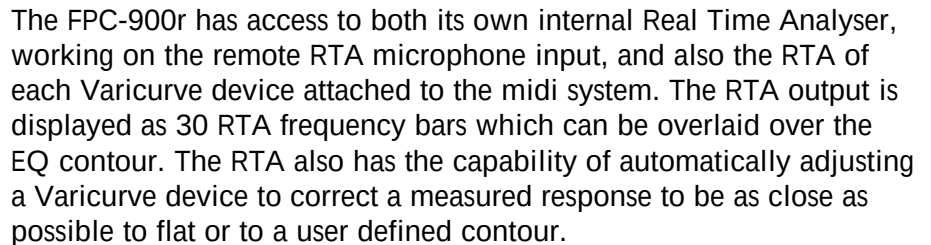
- 10.3 Group ALL ALL is a special case of Grouping. Pressing the ALL key will open a group containing all the available Varicurve channels connected to the system. The channels are scanned for compatible filters and a flat group curve is displayed. All of the group facilities are available to the 'All' members. The Channel Keys will add or remove members from the All selection but the resultant combination of members is not preserved when ALL is turned off.



GROUP ASSIGNMENT

When several channels are entered into a group, the FPC-900r follows several simple rules to select the filters available on the Group display.

- A record is kept of all the filter frequencies used by the group members.
- Each filter is rated according to how large its cut or boost parameter is. The greater the cut or boost, the higher the score for that filter. Narrow notches are also given a higher score.
- The six or 12 highest scoring frequencies are used as the group filters for the display.
- Each Varicurve channel in the group is now scanned and an attempt made to match each channel filter to a group filter.
- If there are no spare filters then that group filter will have no effect on the channel when it is adjusted - this is indicated by the channel led flashing when this group filter is selected.



The Real Time Analyser has six dedicated memories, each of which can store a complete 30 band RTA output graph. These can be used individually or summed together as a target for the Auto EQ facility. The memories are labelled A to F to differentiate them from the EQ program curves.

The Real Time Analyser output can also be used to display an SPL (Sound Pressure Level) meter when used with a calibrated microphone.

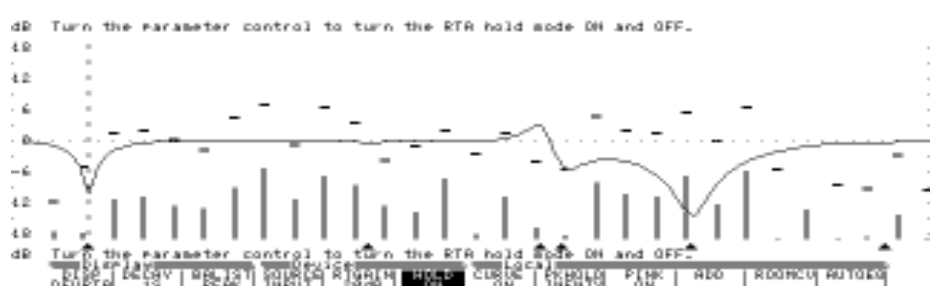
11.1 RTA Menu

The following menu items are available by pressing the RTA key. To select an item to change, press the Speed Strip below the item. A list of options on the selected item will appear above the menu. Use the Parameter control to change between the options available for the selected menu item. Press the RTA switch again to return to the normal filter editing mode. Pressing a Device key will change the currently selected channel whilst keeping the same Menu and Item on the screen.

NOTE that the items marked (Channel) will only apply to the currently selected device channel.

NOTE also that some of the RTA functions are not available in all modes of the RTA system, e.g., with the SPL meter on, it is not possible to run the Auto EQ function. Any items not usable in the current mode are removed from the menu when that RTA mode is selected.

Fig. 11.1 RTA Menu



RTA Menu

DISP (Display) [OFF, DEVRTA, INTRTA, INTSPL]

This item selects the display mode for the RTA and SPL bargraph. DEVRTA will select an RTA display generated from the selected device channel. With DEVRTA selected the exact source within the device (Input, Output or Mic) is chosen in the SOURCE item detailed below. INTRTA and INTSPL both use the remote's Mic socket as the source. INTSPL will create a single bargraph displaying the signal level received by the microphone. Weighting can be selected from the EIGHT item detailed below. DEVRTA will not operate over the FSK link since it requires two-way communication.

DECAY (Display) [Adjust value 100mS to 10S or INF]

This adjusts the decay time of the RTA display bars. For Peak mode the decay rate is adjustable from 100mS to 5 Secs with an extra step for INFinite hold. For RMS mode the decay rate is adjustable from 100mS to 10 Secs.

BALIST (Display) [RMS, PEAK]

This item sets the ballistics of the RTA bars or SPL display bargraph.

SOURCE (Display) [INPUT, OUTPUT, MIC]

This item selects the RTA signal source and is only displayed when DISP is set to DEVRTA.

With INPUT selected the source will be the line input signal to the selected device. Similarly OUTPUT will display the RTA of the device line output. With MIC selected the remote will display the microphone signal into the current device.

RTGAIN (Device/Channel) [Adjust value 0dB to 40dB (or 70dB internal)]

This adjusts the overall level of the RTA or SPL display. Use the parameter control to adjust the RTA gain from 0dB to 40dB(or 70dB) in 1dB steps. If RTA gain is set too high the arrow shaped clip indicator will show in the top left hand of the display area.

With the SPL meter selected in DISP this box will adjust the range of the SPL display, from 50dB to 140dB in 10dB steps.

HOLD (Display) [ON, OFF]

This item turns the RTA Hold On and Off. The RTA display will be held stationary when this item is set ON. This is useful for grabbing RTA curves ready for storing in an RTA memory.

CURVE (Local) [ON, OFF]

This turns the current EQ curve on and off. The CURVE box is only displayed when the SPL meter is off.

Display				Device				Local			
DISP	DECAY	BALIST	SOURCE	RTGAIN	HOLD	CURVE	PKHOLD	PINK	ADD	ROOMCU	AUTOEQ
DEVRTA	1S	PEAK	INPUT	20dB	ON	ON	INFTY	ON			

RTA Memories

Storing an RTA

Recalling an RTA

SPL WT (Local) [OFF, A-WT, C-WT]

This sets the weighting for the SPL Bargraph display and is only displayed when DISP is set to INTSPL.

Refer to Appendix 18.4 - 'Frequency Weighting Characteristics'

PKHOLD (Remote) [Adjust value 0.1S to 5S, OFF and INFINITY]

Adjusts the hold time of the RTA peak dots.

PINK (Remote) [OFF, ON]

This item turns the FPC-900i interface pink noise output on or off.

AUTOEQ (Channel) [Select to start]

Selecting this item will start the auto-equalisation utility.

Refer to Section 13.0 - 'Auto EQ'

ADD (Remote) [Turn parameter to start]

This item allows two EQ contours to be added together.

RMCURV (Remote) [Select to start]

Converts the currently displayed RTA into an EQ Contour.

Refer to Section 12.0 - 'Room Curve and Add Curve' for more information.

11.2 RTA memories Real Time Analyser graphs can be stored in one of six specialised memories. Stored RTA memories can be used by the Auto EQ function to generate EQ curves to null a measured room RTA.

11.3 Storing an RTA With the RTA menu on the screen select STORE. The parameter control will now adjust the memory letter A to F as indicated in the status area. Store is completed by pressing STORE again. It is possible to exit from Store RTA without changing anything by pressing the Speed Strip. It is not possible to name or lock RTA memories.

11.4 Recalling An RTA With the RTA menu on the screen select RECALL. The parameter control will now adjust the memory letter A to F as indicated in the status area. Recall is completed by pressing RECALL again. The RTA will be recalled in Hold mode ready for running an Auto-EQ. It is possible to exit from Recall without changing anything by pressing the Speed Strip.

Display				Device				Local			
DISP	DECAY	BALIST	SOURCE	RTGAIN	HOLD	CURVE	PKHOLD	PINK	ADD	ROOMCV	AUTOEQ
DEURTA	IS	PEAK	INPUT	20dB	ON	ON	INFTY	ON			

Room Curves ROOMCV

12.0 Room Curve and Add Curve

Quick Reference

Room Curve will convert an RTA display of bars and convert it to an eq curve.

Add Curve will add a stored eq curve to the current eq curve.

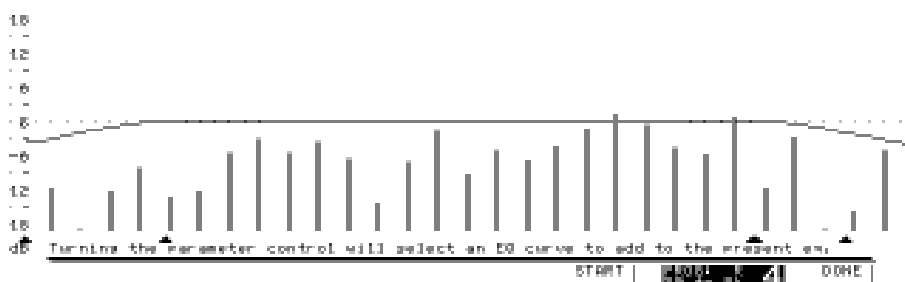
These two utilities are to be found in the RTA Menu and can be accessed by pressing the RTA key and then selecting one of them using the speed strip.

12.1 Room Curves Each environment in which the remote is used will have a characteristic response curve which can be measured and stored using the Real Time Analyser built into the FPC-900r. This curve will be a record of the frequency response of the room either flat or after the user has added equalisation to the sound source. The FPC-900r has twelve program memories set aside for storing these room curve records.

It may be that a good sound has been created by careful use of the Varicurve equalisers and the resulting, adjusted room response is recorded to either duplicate at a later time with a different band at the same site or to use as an optimum equalisation response at a different venue. Room curves created from an RTA response can, of course, be used as the target response for the Auto EQ system detailed in the next Section.

12.2 ROOMCV This utility is only available when there is an RTA bar display on the screen. Selecting ROOMCV on the speed strip and turning the parameter control will run the utility. The room curve algorithm calculates filter parameters which best approximate the curve produced by the

Fig. 12.1 Add Curve



ADD Curve

RTA pattern. If the curve is too complex for the available filters to approximate, the shape is simplified by smoothing. If the current device is in Stereo mode, the curve will be created using 6 filters and copied into both channels of the device. In Dual only the current channel is used. If the device is in Mono mode, the curve will be more precise, using all 12 filters if necessary.

Once finished, the Remote will change to Store mode, prompting the user to store the resultant curve in one of the twelve Room Curve memories (or a program memory in the current device). Rooms 1 to 6 are locked presets which may be unlocked and overwritten. To unlock one of the 6 factory presets, recall the curve into the current curve in Dual access mode and select PRGLCK in the UTILS menu. Room Curves can only be recalled when the device is in the same access mode as when the curves were stored. The factory preset Room Curves can therefore only be recalled into a Dual access mode device even though they can be used as a target curve for any access mode in Auto EQ.

Refer to Section 6.0 'STORE'.

Note: There is only one set of 12 Room Curves available within the remote, there are no Room Curve program locations in the individual devices.

12.3 ADD Curve Add Curve uses many of the techniques employed by Room Curve. With Add Curve the user can take the current equalisation curve and add another stored program curve to it. Selecting ADD in the RTA menu will enter the Add Curve Menu.

DONE Will leave this menu and return to the RTA Menu.

PROG Select PROG and use the parameter control to select a stored program to add to the current equalisation curve.

START Select START to begin the addition.

Note: The program to be added must be in the same mode (Stereo, Dual, Mono) as the current device. Any programs that are in the wrong access mode will be stepped over.

When this process is started, the two curves will be added at each of the 210 frequency points available to the system. This will create a composite curve which may be too complex for the number of filters available, so the utility will simplify the contour by smoothing so that the available filters are able to duplicate the new curve. As with Make Curve, up to 12 filters will be used in Mono mode and up to six in Dual or Stereo.

The new curve can now be stored in a program memory in the current device or into one of the 12 room curves stored in the remote itself.

Refer to Section 6.0 'STORE'.

AUTO EQ A Simple Auto EQ

13.0 AUTO EQ

Quick Reference

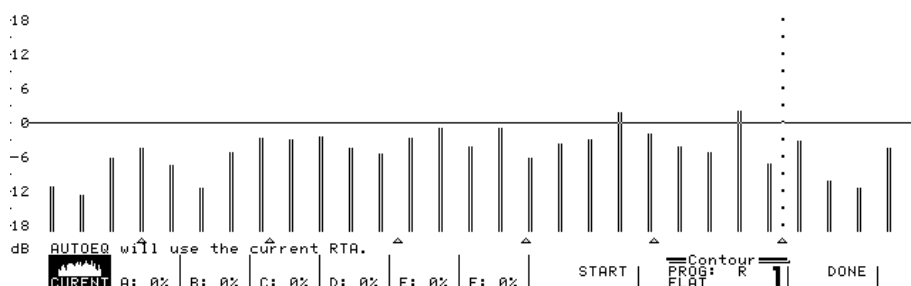
- 1 Press RTA, select AUTOEQ.
- 2 Select the current RTA or a mixture of the stored RTAs as the present response.
- 3 Select a target response curve in Contour.
- 4 Select START

The Auto EQ function allows the FPC-900r remote to adjust a room equalisation curve in response to a measured RTA in the same way as the FCS-926 Auto EQ. Pink noise is injected into the audio system and the output from the system measured with the FPC-900r internal Real Time Analyser. The remote takes the RTA graph and uses it to calculate an equalisation curve that will attempt to correct any frequency response errors in the environment (or circuitry) that produced the RTA. The box below details how the Auto EQ works.

13.1 A simple AUTO EQ The FPC-900r is very flexible in the RTA information it can use. The easiest source of a room response measurement is the current RTA reading.

- ① Press the RTA key to enter the RTA menu.
- ② Start the RTA by adjusting the DISP menu item to INTRTA.
- ③ Plug a microphone into the remote's RTA input.
- ④ Press the UTILS key and select MORE. Adjust the PINK item to turn the pink noise source in the rack interface on. Connect the pink noise output from the interface to the system to be measured.

Fig. 13.1 AUTOEQ Using the Current RTA



Mixed RTA Sources

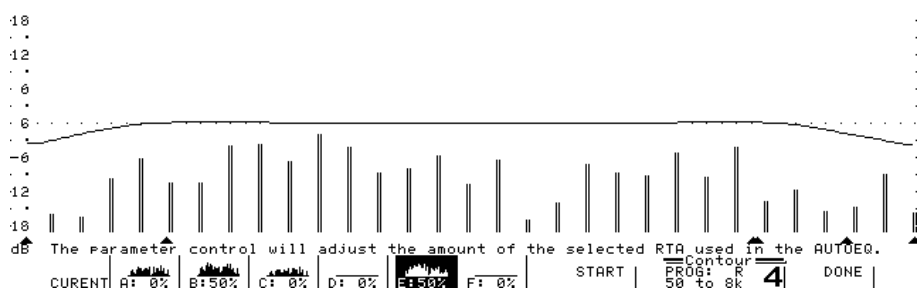
- ⑤ Return to the RTA menu and adjust the RTGAIN item to show the frequency response of the pink noise across the analyser bars. Avoid the clipping indicator showing in the top left of the screen. BALISTics should be set to RMS and DECAY to at least 1 Second. Longer times will require more settling time. Wait for the bars to settle and select HOLD ON.
- ⑥ Select AUTOEQ. The AUTOEQ menu will be drawn. Select CURENT to use the current RTA as the source response to work on. Select Contour and choose a target equalisation curve to adjust to. (Program R1 will equalise to FLAT).
- ⑦ Select START to begin the Auto Equalisation function.
- ⑧ The resulting curve can be stored or the process repeated with a different RTA graph used as the source data.

13.2 Mixed RTA Sources. In addition to using the current RTA graph as the measured room response, it is possible to use one, or a mixture of two or more, of the stored RTAs in the remote. If different RTA measurements are taken from different points in the venue, the user can use an average of each of the RTAs to create a composite room RTA. Different parts of the room can be weighted differently - Front of House could count as 60% of the room RTA whilst the side areas take 20% each.

The six menu items in the AUTOEQ menu labelled A: to F: represent the six RTA memories. The small graphs in each box are a representation of the stored RTA measurement. When a box is selected, the parameter control can adjust the amount of the RTA added from that memory into the displayed mix from 0 to 100%. The resultant sum of the various RTA memories will be the room RTA that is plugged into the AUTO EQ calculation. The sum of the memories is constantly updated and displayed on the screen.

Note that, although the values are displayed as percent, the total RTA will never add up to more than 100%. Dialling up 100% for two different memories will result in an average made up of half of each. Exactly the same effect is given by selecting 20% from each. Don't worry about having to make the total add up to 100% - it always ends up being one complete RTA.

Fig 13.2 AUTOEQ using a Mix of RTAs



Target Room Curves

13.3 Target Room Curves The Contour box allows the user to select a response curve that describes the desired frequency response for the room being equalised. Generally the user will stick to curve R1 which is FLAT or possibly curve R2 which has 3dB/octave roll offs at top and bottom. The possibility also exists to use other stored equaliser curves. It might be that the requirement is for a sound that always has 6dB of boost at 10kHz. If so, use the standard filter controls to create the curve and store it in one of the device program memories or overwrite one of the remote Room curves (R1 to R12 - **Refer to Section 6.0 'STORE'**). The stored curve can now be selected in the Contour item to be the target response for the next AUTOEQ calculation. The chosen response curve is always displayed on the screen whilst in the AUTOEQ menu.

One further possibility is to use the RTA measured at one venue to be the target equalisation at another.

- ① Measure the RTA at the first venue and use the ROOMCV facility in the RTA menu to turn the RTA graph into an EQ curve.

(Refer to Section 12.0 'Room Curve and Add Curve').

- ② Store the resultant curve into one of the remote Room curve memories e.g. R7. (Give it a name so it doesn't get overwritten.)
- ③ At the second venue set up the RTA to measure the room response and perform an AUTOEQ using the response curve stored in R7 as the target response. The second venue will be equalised to give a room response similar to the first venue.

AUTO EQ - How it works.

After inverting the combined RTA response and adding to it the target curve, a sophisticated algorithm analyses the resultant curve and calculates the filter parameters required to match the resultant curve. If the curve shape is too complex for the number of filters available, it is simplified by smoothing. To prevent filters being wasted by trying to compensate for impossible deficiencies of the system or environment at the extremes of the frequency response, AUTO EQ will not analyse nor allocate filters to frequencies beyond the end points where the target curve falls more than a few dB below the 0dB centre line.

AUTO EQ on a stereo device will produce the same curve on both channels whereas only one channel of a dual device will be affected.

14.0

EVENT

Quick Reference

- Press EVENT to enter the Event menu.
- Trigger an event by pressing the Speed Strip under the appropriate event box.
- Step through consecutive events by selecting STEP ON and then step using the EVENT key.



The Event system on the FPC-900r gives the user the ability to send a Midi program change out on each Midi channel, whether or not it is a Varicurve or Omnidrive device. These Events are fired off by selection from the speed strip or by enabling the EVENT key to step sequentially through a list of programmed Events.

There are two screens concerned with Events. The first press of the EVENT key takes the user into the main Event Select menu. Here the Events are selected and triggered. First, however we must create some Events to use.

- 14.1 Event Edit Screen
- After the first press of the EVENT key to enter the Event Select menu, select EDIT using the speed strip. The display now enters the Event Edit display. See fig 14.1.
- EVENT NO

Selects the number of the Event to edit. 50 Events are available.
- NAME

Allows the user to give the current event a name.
- PROGRAM

Select this to assign a program change to a device.
- DEST

This selects an Event to copy the current event to.
- COPY

This will begin the Event copy.
- DONE

Will return to the main Event Select menu.

Fig. 14.1 Event Edit



Event Edit Screen

The screen lists each available device in a similar format to the device Index screen. If a device is identified by the FPC-900r, the centre column will show 920, 926 or 388. Either side of the device data are one or two device names, depending on which mode - Mono, Stereo or Dual - that the device is in. At the ends of each device entry are the Program changes for this device in the current Event. If no program change is selected for this device the program number is noted as 'off' with a bar '—'. If the access mode for the chosen program does not match the access mode of the current device, an exclamation mark (!) will be displayed after the program number.

EVENT NO [Adjust value]

Select this item with the speed strip and turn the parameter control to choose an Event to edit. When Event edit is entered this will default to the last triggered Event.

50 events are available in the FPC-900r.

NAME [Enter name with Device keys]

Select this item to change the name of the current Event. When selected this item will display the last assigned name until letters are entered from the Device keypad. The Device keys now enter letters into the event name. Select another menu item with the speed strip to finish entering the name, there is no Enter key to press.

PROGRAM [Adjust value]

This item changes the program numbers assigned to the devices. With this item selected the Device keys move between the available devices in the display. Selecting a device with the Device keys will highlight the program number text for that device. The assigned program number for that device is duplicated in the PROGRAM box along with the program name. If the selected channel is not a Varicurve device the program number can still be adjusted from 1 up to 128 but the device type area at the centre of the line will show '???' to denote an unknown device.

Once a program number has been assigned to a channel, select another device with the Device keys and adjust that with the parameter control, continuing until the event is complete.

DEST [Adjust value]

To copy the program changes of one Event into another first use the EVENT NO box to change to the source event, the one you wish to copy FROM. Now select DEST and adjust the Event to copy to, again using the parameter control. Once the destination has been set, select COPY.



Event Select Menu Triggering Events

- COPY** [Select to begin copy]
All the program changes linked to each device will be copied into the destination Event along with the source program name.
- DONE** When all changes have been made to your Events, return to the Event Select menu by choosing DONE. All changes will have automatically been saved.

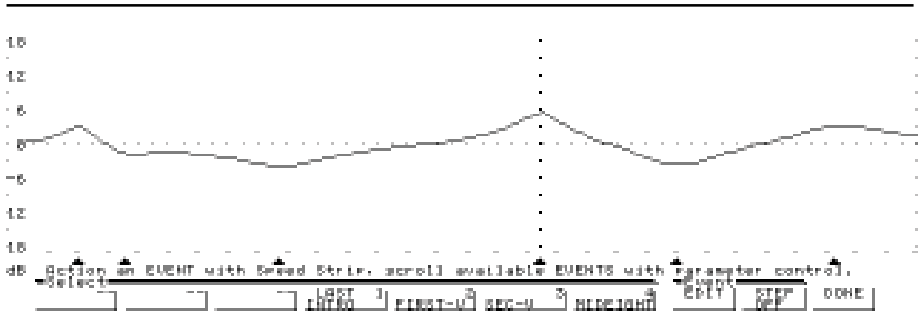
14.2 Event Select Menu

- EDIT** Select this item to enter the Event Edit menu.
- STEP** If this box is ON, the Event key can be used to step through Events
- DONE** Selecting DONE will return to filter editing.
- The first seven boxes detail seven of the 50 available Events. After an Event has been triggered, these seven boxes will be centred on the last triggered Event. Below the Event numbers are the user defined Event names. The last triggered Event is always marked with the word 'LAST' alongside the Event number. To scroll through all 50 Events turn the parameter control. The events available along the speed strip will scroll as the control is turned.

14.3 Triggering Events

- STEP** [OFF, ON]
With STEP selected to ON, the EVENT key can be used to step sequentially through the programmed Events. This is useful if a show has been built up which only requires each Event to be actioned in numerical order. Once enabled the Event led will flash. Each press of the EVENT key will now step to the next Event. This facility is not available outside of the Event Select menu.

Fig. 14.2 Event Select



INDEX with Events

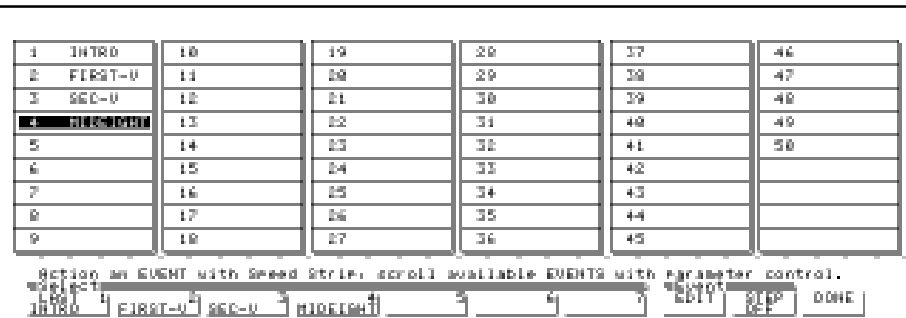
EDIT [Select to enter]

Select EDIT to enter the Event Edit screen.

DONE Selecting DONE will return to the main equalisation curve.

14.4 INDEX with Events. INDEX can be pressed while in the Event Select screen to give a complete list of all the Events available from 1 to 50 along with the Event name. See fig 14.3. Turning the parameter control will move the highlight through the Index at the same time as the Events are scrolled along the speed strip. The highlight will always correspond to the Event in the centre of the seven available on the speed strip. The Event must still be triggered by selecting it from the speed strip. Press INDEX again to return the display to the normal Event Select screen.

Fig. 14.3 Event Index



15.0 Transfer (XFER)

The Transfer menu is used to pass information to and from the remote and the Varicurve devices on the system. It should be used if the remote has been plugged in to a Varicurve system or device where programs are already stored and Eq already prepared. Data cannot be transferred to and from an Omnidrive device.

15.1 XFER Menu Enter the XFER menu by pressing UTILS and selecting the XFER option. The XFER menu is shown in fig 15.1. Only a few option combinations are allowed, all others are locked out.

DATA AREA The Data Area item sets up the type of data that is to be transferred. PROG 1 to PROG 50 are available to transfer individual programs. DUMP will transfer the complete contents of a Varicurve device. A DUMP from a Device to the Remote will take approximately 20seconds.

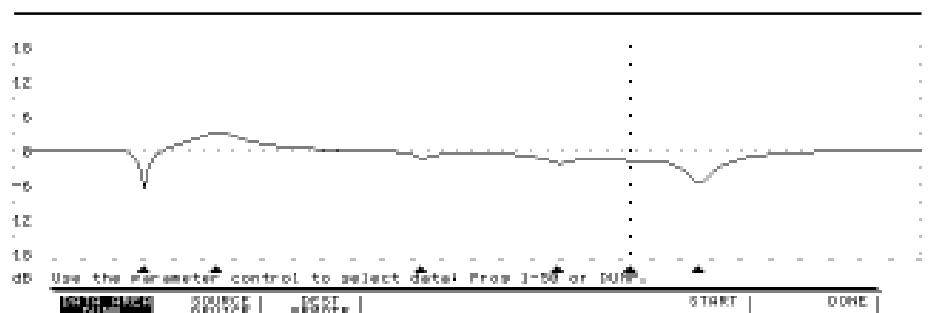
SOURCE The Source item defines the source from which the data is to be transferred.

DEST The Dest item defines the destination to which the data will be transferred. Only a few combinations of DATA AREA, SOURCE and DEST are available.

START Select Start to begin the data transfer. In a DUMP mode the START box will display a percent of data transferred while the data transfer is proceeding.

DONE Will return to the UTILS menu.

Fig 15.1 XFER Menu



XFER (Transfer)

PROGs 1 to 50 can be transferred between REMOTE and DEVICE.

A complete Varicurve DUMP can be transferred from DEVICE to the REMOTE or from ALLDEVS to the REMOTE. The user is protected to some degree by an "ARE YOU SURE" message, to which the user must respond by selecting 'YES' or 'NO' from the Speed Strip. DUMP will overwrite all information linked with a DEVICE or ALL DEVICES within the FPC-900 so be careful before this option is used. DUMP should be used when the Remote is connected to Varicurves that may have been changed since they were last connected to the FPC-900 remote.

DUMP each DEVICE one at a time (or use ALLDEVs if all may have been edited) to ensure that the program contents and current set-up of the connected Varicurves is duplicated in the set-up of the remote.

NOTE that recalling a program in a Varicurve device only sends a program change to the device and does not transfer the program parameter data from the device to the remote, so it is essential that the two match.

16.0 Smart Card

The Smart Card socket on the front of the remote is designed to use PCMCIA2 memory cards of between 128kbyte and 2Mbyte storage capacity. Files are stored on the card in a 'Pseudo-floppy' format using standard DOS structures. See the box at the end of this section for compatibility information. As existing Flash memory cards have erase and re-write limitations, only SRAM memory cards are fully supported in the current remote Smart card software. The exception is that a full remote set-up (an ALLDATA file) is stored to a Flash card when it is formatted. The Flash card remote set-up can then be read at any time, but only written to by performing a complete format again. This is useful for archive purposes as Flash cards have no batteries to run down. **The FPC-900 has been tested using Fujitsu 256k FLASH cards.**

NOTE: Flash cards should be the older Series 1 Flash cards, newer Series 2 Flash cards may not work.

Omnidrive data cannot be stored or recalled on the FPC-900R

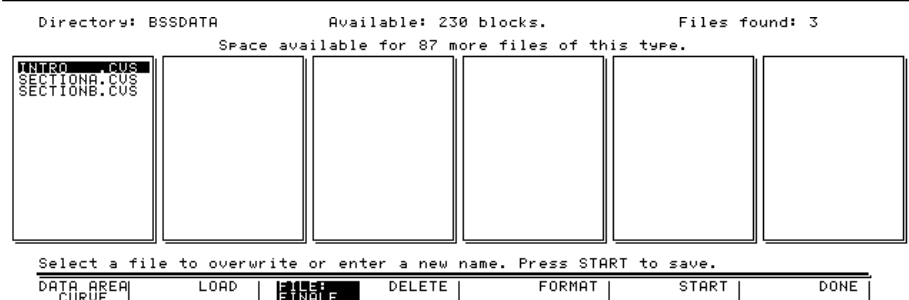
16.1 CARD Menu Enter the CARD menu by pressing UTILS and selecting the CARD option.

Across the top of the CARD screen are detailed the number of blocks available on the card and the number of files of the selected data type that can be fitted onto the card. The directory name at the top left of the screen will always show BSSDATA. At the top right are the number of files found of the current data type.

DATA AREA [CURVE, RTA, DEVICE, ALLDATA, EVENTS]

This item selects the area of data that is to be acted upon, whether it is to be Loaded, Saved or Deleted. As this item is altered, the screen will redraw to give a directory of the files of this type available on the card. The maximum number of files of each type is limited by the amount of card space available up to a limit of 90. If the data type is CURVE and there are no curves stored, for example, the limit is 90 as each file is very small. If the data type is ALLDATA, the maximum may be limited by card size to 1 or 2, as each file is rather large.

Fig. 16.1 Card Menu



CARD Menu

Each file will be saved from the current data area of the appropriate type. Saving a curve will save the current equalisation data for the current device, saving a device will save the current device data and so on.

Each area saves the following data:

- CURVE** In SAVE this saves the currently displayed program name followed by the currently displayed equalisation filter parameters. To save a program that is not in the edit area it must be recalled first. LOADING a program will recall the data to the current edit area on the current device. It should then be stored to a suitable program number. It is possible to SAVE room curves by recalling them to the display in the same way as programs. Only those curves saved with their access mode the same as the current device can be loaded. The different access modes, (MONO, STEREO and DUAL) are denoted by different filename extensions when they are saved. Only curve files of the current access type are listed in the file list.
Curve names have no link with the file names, any name can be used for saving files.
- RTA** This saves and loads the current RTA bargraph data. To save one of the stored RTA graphs it should be recalled to the display first. **The user should select DEVRTA or INTRTA in the RTA menu before recalling an RTA.**
- DEVICE** Selecting DEVICE will save and load the currently selected device data. All program data and program names are included. Room curves must be saved individually using CURVE, or as part of ALLDATA.
- ALLDATA** ALLDATA should be used for backing up a complete remote set-up. It saves all 16 device datasets (whether in use or not), all RTAs, events and many of the remote set-up variables. If FORMAT is selected with a FLASH card in the slot, the card will be formatted with an ALLDATA file using the current remote data. This allows FLASH cards to be used for long term back-up. A FLASH card can be read in the same way as an SRAM card with no restrictions.
- EVENTS** Saving and LOADING EVENTS will save and load all event data including names.
 - LOAD** [Enter Filename]
Select LOAD to recall data from a FLASH or SRAM card. Now turn the parameter control to select a file from the file list or type in a name using the numeric keys. Press START to complete the LOAD. After loading a DEVICE or ALLDATA, the screen will go automatically to XFER to remind the user to update the Varicurve devices.
 - SAVE** [Enter Filename]
Select SAVE to save data to a formatted SRAM card. Now turn the parameter control to select a file from the file list to overwrite or type in a new name using the numeric keys. Press START to complete the SAVE. Saving a DEVICE or ALLDATA may take a few seconds. If the file already exists, the user will be prompted "ARE YOU SURE?".

CARD Menu

DELETE [Enter Filename]

Select DELETE to choose a file to delete from an SRAM card. Now turn the parameter control to select a file from the file list or type in a name using the numeric keys. Press START to complete the DELETE. The user will be prompted "ARE YOU SURE?".

FORMAT Select FORMAT to prepare a card for saving data. NOTE: that in the same way that formatting a floppy disc deletes ALL data on the disc, formatting a FLASH or SRAM card will delete all existing data on the card. It is not possible to save data to an unformatted card. Formatting a card clears all data and prepares the card for files to be written. See the box following this section for more information on formatting.

Select START to begin the format. You will be asked to confirm that you wish to format the card. Fig 16.2.

Formatting a FLASH card will also write an ALLDATA file to the card. If a FLASH card is detected when a FORMAT is STARTed, the card is formatted as usual and then a single ALLDATA file is written to the card using the current remote data. No further SAVE operations can be performed on a FLASH card although the saved ALLDATA file can be LOAded at any time. As FLASH cards have a virtually limitless data retention life compared to an SRAM card (which has a data retention life of 1 to 5 years depending on card size) this is a good method of handling long term backups. See the box at the end of this section for information on the possibility of copying files to a PC.

START START will begin a SAVE, LOAD, DELETE or FORMAT operation.

DONE DONE will leave the CARD menu and return to UTILS.

NOTE The user will be warned if the internal SRAM card battery voltage becomes low. The battery should be replaced as soon as possible to protect the stored data. The card has a small secondary battery to protect the contents while the main battery is changed.

Fig 16.2 Are You Sure?

Directory: BSSDATA	Available: 230 blocks.	Files found: 3
Space available for 87 more files of this type.		
INTRO.CUS SECTIONA.CUS SECTIONB.CUS	This will delete all data on the card - ARE YOU SURE?	
FLASH cards will have an ALLDATA backup file written to them after format.		
YES		NO

Card Types

16.2 Card Types The Smart Card interface requires 68pin PCMCIA2 compatible memory cards. Attribute memory is not required and is not used.

SRAM CARDS 128k, 256k, 512k, 1M, 2M. Battery life varies with manufacturer. As an example Fujisoku 256k cards have an approximate life of 5.9 years, 2M cards have an approximate life of 1.1 years.

FLASH CARDS 256k, 512k, 1M, 2M. **All FLASH cards are formatted as 256k with a single ALLDATA file recorded on them. The FPC-900 has been tested using Series 1 flash cards: e.g. Centennial FL256-20-1XXXX-XX.**

Smart Card Format

The Smart Card filing system on the 900r remote uses a 'pseudo-floppy' format. Formatting a Card on the 900r Remote writes a standard PC DOS format to the card beginning at byte 0 as if it were the first byte on a disc. The format writes a DOS boot sector with basic format data but does not write boot software. This is followed by a single File Allocation Table (FAT) starting at byte 200H. The root directory is written with one entry, a sub-directory called BSSDATA. All data files used by the remote are stored in the BSSDATA sub-directory as there are limits to the number of files that can be stored in the root directory.

The different file types used by the remote have different file extensions as follows. The file sizes should be taken as approximate and may change with new versions of software.

CURVE (Mono)	*.CVM	97bytes
CURVE (Stereo)	*.CVS	97bytes
CURVE (Dual)	*.CVD	97bytes
RTA	*.RTA	61bytes
DEVICE	*.DEV	4998bytes
ALLDATA	*.ALL	83118bytes
EVENTS	*.EVT	2001bytes

The 'pseudo-floppy' filing system as used on the remote conforms to the PCMCIA PC CARD standard although it does not format Card Information Structure (CIS) information. BSS has tested and developed the Card filing system using an IBM compatible PC card reader and a range of palm-top computers, but cannot guarantee that the cards can be read by any particular piece of computer equipment. **To be able to transfer files to and from an external computer note the following:**

- ① Always format the card on the external computer.
- ② Always write a sub-directory called BSSDATA into the root directory straight after formatting the card.

17.0 Controlling Omnidrive Devices

DEVICE: | EVENT: **1** | BATT: |

Turn the Parameter control to adjust the gain for this Omnidrive band.

Turn FREQUENCY
to adjust UNITS

	Band A			Band B			Band C			Band D			UNITS
1-L>	Band A			Band B			Band C			Band D			>
2-R>	Band A			Band B			Band C			Band D			Main
	GAIN	MUTE	DELAY	GAIN	MUTE	DELAY	GAIN	MUTE	DELAY	GAIN	MUTE	DELAY	DELAY
	(dB)		(m)	(dB)		(m)	(dB)		(m)	(dB)		(m)	(m)
1-L>	0.0	CH ON	0.000	0.0	CH ON	0.000	0.0	CH ON	0.000	0.0	CH ON	0.000	0.000
2-R>	0.0	CH ON	0.000	0.0	CH ON	0.000	0.0	CH ON	0.000	0.0	CH ON	0.000	0.000

Quick Reference

- Select an Omnidrive device using the Device keys.
- Select the value to adjust using the Speed Strip.
- Adjust the value using the Parameter control.

Only a few of the variables within the Omnidrive p.a. controllers can be adjusted by the FPC-900 remote. Each channel's gain, mute and delay are available along the speed strip in addition to the main delay. No other variables from the Omnidrive are available at the remote.

It should also be noted that no Omnidrive variables are held within the FPC-900 remote. All variable values are passed from the Omnidrive to the remote for display and adjustment and then passed back if an adjustment is made. Store and Recall to internal memory will not work on the FPC-900 remote when an Omnidrive screen is displayed, nor will storing files to a PCMCIA card store or recall any Omnidrive data.

The Remote system should be connected up as in Fig 2.3 on page 10. This allows for the FPC-900 remote to control any Varicurve or Omnidrive on the system while still allowing the meteorology probe to pass temperature and humidity data to all the Omnidrives. Ensure that all Omnidrives are set to Midi XMit Thru and that all Midi Channel numbers are different.

When an Omnidrive device is first selected using the Device keys the display may still show Varicurve information for a short while until the first information is sent back from the Omnidrive. This information is sent every 15 to 20 seconds and allows the remote to synchronise the screen information with the Omnidrive.

Controlling Omnidrive Devices

Turn FREQUENCY
to adjust UNITS
UNITS
m >

The variable labelled UNITS is purely an FPC-900 display variable and has no link to the Delay Units variable on the Omnidrive. The variable on the Remote is only capable of displaying feet or metres as display in the time format would require adjustment with temperature. Turn the Frequency control to adjust the units.

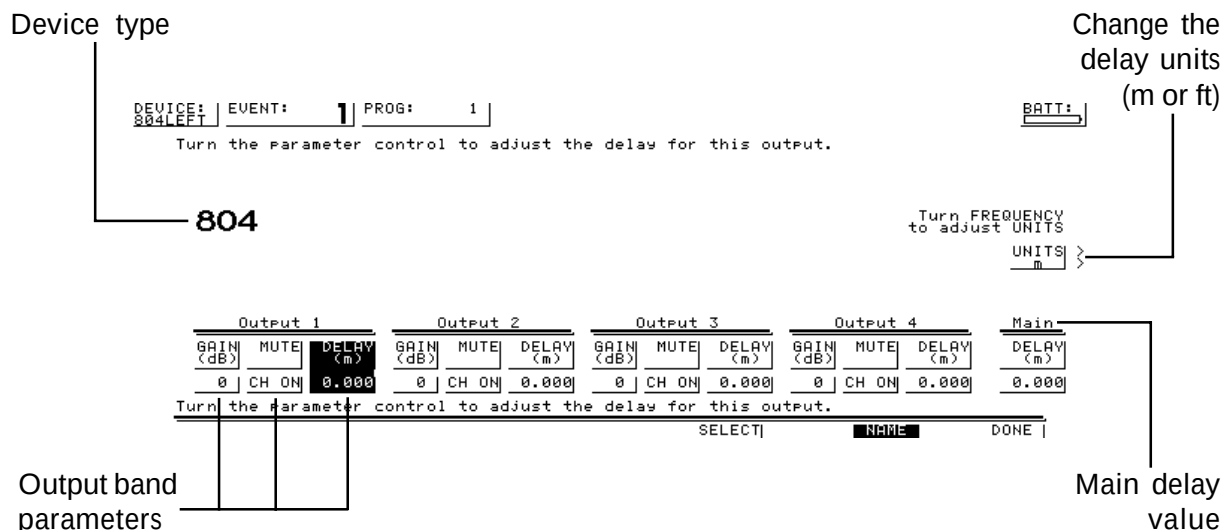
Band A Band B

The Omnidrive delay linking is received and acted upon by the remote, so if three band delays are linked on the Omnidrive they will still be linked together when any individual band delay is adjusted on the Remote. The drawing here shows bands A and B delays linked. The band delay linking cannot be changed on the Remote.

DELAY
(m)

The information about hidden variables is also transferred to the FPC-900 remote so hidden variables on the Omnidrive cannot be viewed on the Remote. Hidden variables on the Omnidrive will be represented by empty variable boxes on the Remote. The drawing here shows a delay variable marked as hidden on the Omnidrive and so is displayed with a blank box.

18.0 Controlling Delay Devices



CONNECTING Connect a TCS 803 or 804 device as a 'spur' from the MIDI THRU socket of another device on the loop. Do NOT connect anything to the MIDI OUT sockets of the 803/804 devices.

RECOGNITION Since TCS80X devices do not transmit Varicurve style ID responses, they are not automatically recognised by the FPC900 Varicurve remote. To make the FPC900 aware of a TCS80X device, and be able to control it, follow this procedure:

Press the Index button, and choose 'Select' on the speedstrip.

Then press the Channel button corresponding to the MIDI channel of the TCS80x device you wish to connect.

Select Name, and enter either 803 or 804 as the name of the device (using the Shift key to get the characters written on the panel in boxes e.g. 1, 2, 3). **NOTE: If the device has expanded memory (denoted by an 'E' appended to the model number during the power-up sequence), add an E to the name (i.e. 803E or 804E).**

Press Index again to leave the Index and then press the Channel key of the chosen TCS80X channel.

The FPC900 will start controlling any TCS80X device on the current channel.

POLLING/REFRESH Since the TCS80X devices do not take part in the feedback loop, the FPC900 cannot know about control changes made on the device itself. The FPC900 transmits ALL TCS80X device data when the unit is **first assigned in the Index**, thus overwriting any control changes made on the device.

It is important to realise therefore that any settings in the TCS80X devices will be lost when first controlled by an FPC900, but changes made on the TCS80X will override the FPC900.

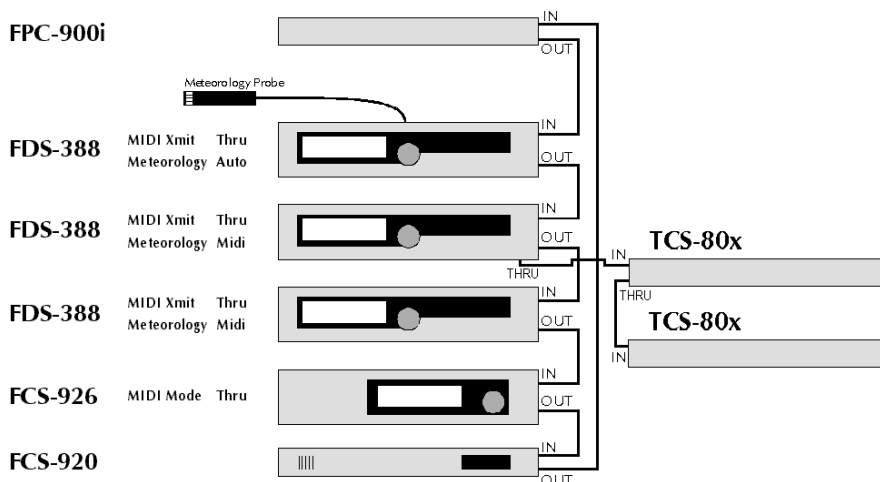
This will ensure that events driven from the FPC900 are not immediately overwritten by the FPC900 sending the channel delay values again. If you wish to ensure that the FPC900 changes are re-sent to the TCS80X, then you must change to the Index screen and enter the unit name again.

CONTROL The control screen on the FPC-900 allows delays, levels and mutes in the TCS804 to be adjusted. The units of measurement for delays may also be set. Rather than using the relative delay method employed by the TCS80X series, the FPC900 uses a master delay which is internally added to the individual delay times. Note that this master delay is added to every output, regardless of mono/stereo settings. Note also that the +/-6dB range of level control can be restricted within the TCS804 device by the setting of the headroom control. The sum of headroom and level may not exceed +20dB. The FPC900 will not be aware of headroom settings, and will always assume that the full +/-6dB range is available.

All of the controls for the 80X units are shown on the screen when the appropriate channel is selected. Use the speed strip to select the parameter that you wish to edit, and then rotate the parameter wheel to change the value. The frequency knob can be used to change the value of delay units between *m* and *ft*.

STORE/RECALL Use the store/recall buttons to store/recall in the usual way. The 900r can store up to 12 programs for each device connected, although these are not shown on the 50 program-location screen (and cannot be named).

Fig. 18.1 Wiring convention for 80x units



19.0 Warranty Information

This unit is warranted by BSS Audio to the original end user purchaser against defects in workmanship and the materials used in its manufacture for a period of one year from the date of shipment to the end user.

Faults arising from misuse, unauthorised modifications or accidents are not covered under this warranty. No other warranty is expressed or implied.

If the unit is faulty it should be sent, in its original packaging, to the supplier or your local authorised BSS Audio dealer with shipping prepaid.

You should include a statement listing the faults found. The unit's serial number must be quoted in all correspondence relating to a claim.

IMPORTANT

We recommend that you record your purchase information here for future reference.

Dealer Name:

Dealer Address:

Post/Zip Code:

Dealer Phone No.:

Dealer Contact Name:

Invoice/Receipt No.:

Date of Purchase:

Unit Serial Number:

In keeping with our policy of continued improvement, BSS Audio reserves the right to alter specifications without prior notice.

The **VARICURVE** series was designed, developed and produced by BSS Audio, Hertfordshire, England.

Phone (+44) (0)1707 660667. Fax (+44) (0)1707 660755.

World Wide Web address: <http://www.bss.co.uk>

VARICURVE is a registered trade mark owned by BSS Audio.

Transient Suppressor Replacement Spares Ordering

20.0 Appendix

20.1 Transient Suppressor Replacement The primary of the mains input transformer on the 900i Interface is protected from high voltage spike interference by two voltage dependent resistors (VDR). These provide a momentary short circuit to voltage peaks in excess of the normal voltage rating.

Should your unit be inadvertently connected to three phase line/line voltages, or to 240v when selected for 120v, or any other incorrect voltage, these suppressors are likely to fail in a short circuit mode. This will be demonstrated by repeated mains fuse failure at switch on.

Even in this case of extreme overvoltage the unit is protected against failure, and the simple removal of these suppressors will allow the unit to be used again. However it is important that they are replaced as soon as possible to ensure continued protection.

The two VDRs are mounted on the small circuit board LVS300, attached to the rear of the 120/240v selector switch. They are specified as Philips 2322-594-61312 (Max voltage 130v).

WARNING! Ensure the unit is disconnected from mains power before attempting removal.

20.2 Microphone Stand Adaptor The base of the 900r remote is supplied with four fixing holes for an Omnimount adaptor. The adaptor should be fitted with four M4 screws of **maximum length 6mm otherwise internal damage will result.** Omnimount parts are available from Canford Audio in the UK (+44) (0)91 415 0205

	Canford Part no.
Omnimount clamp 50ST	18-532
Mic stand adaptor ($\frac{5}{8}$ "-27tpi- US) 5000MA	18-782
For Europe a $\frac{5}{8}$ " to $\frac{3}{8}$ " Whitworth insert is required in addition to the adaptor.	53-217

Midi Implementation

20.3 FPC-900 Midi Implementation

V1.0 7 September 1993

FUNCTION	TRANSMITTED	RECOGNISED	REMARKS
BASIC CHANNEL Default Changed	1-16 1-16	X X	Memorised
MODE	X	X	
NOTE NUMBER	X	X	
VELOCITY	X	X	
AFTER TOUCH	X	X	
PITCH BENDER	X	X	
CONTROL CHANGE NRPN LSB 98 NRPN MSB 99 Data LSB 38 Data MSB 6	O O O O	X X X X	Note 1
PROGRAM CHANGE True Number	0-49 1-50	X X	0-127 1-128 Note 2
SYSTEM EXCLUSIVE Dump Request Dump Follows Program follows Program Request RTA Request Message	O O O O O O	X X X X X X	
SYSTEM COMMON		X	X
SYSTEM REAL TIME		X	X
AUX MESSAGES Reset Controllers	O	X	Note 3

O: Yes

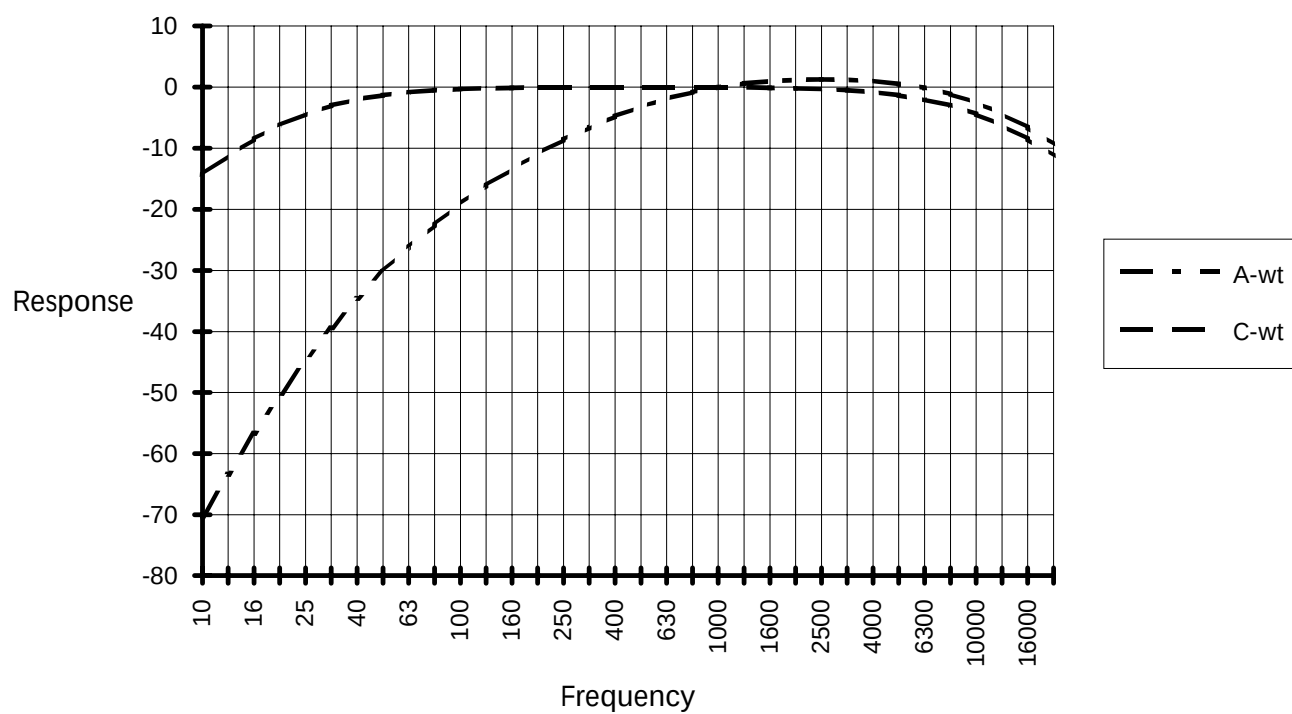
X: No

NOTES:

- 1: Non-registered Parameter data LSB is not transmitted for any parameters except frequency, which uses 2 bytes.
- 2: 0-127 (1-128) for non-Varicurve devices.
- 3: 'Reset All Controllers' has the same action as pressing the FLAT button on the front panel. It will set to default values all of the filter parameters and the gain setting for the current channel in dual or 12 band modes, or both channels in stereo mode.

Frequency Weighting

20.4 Frequency Weighting Characteristics



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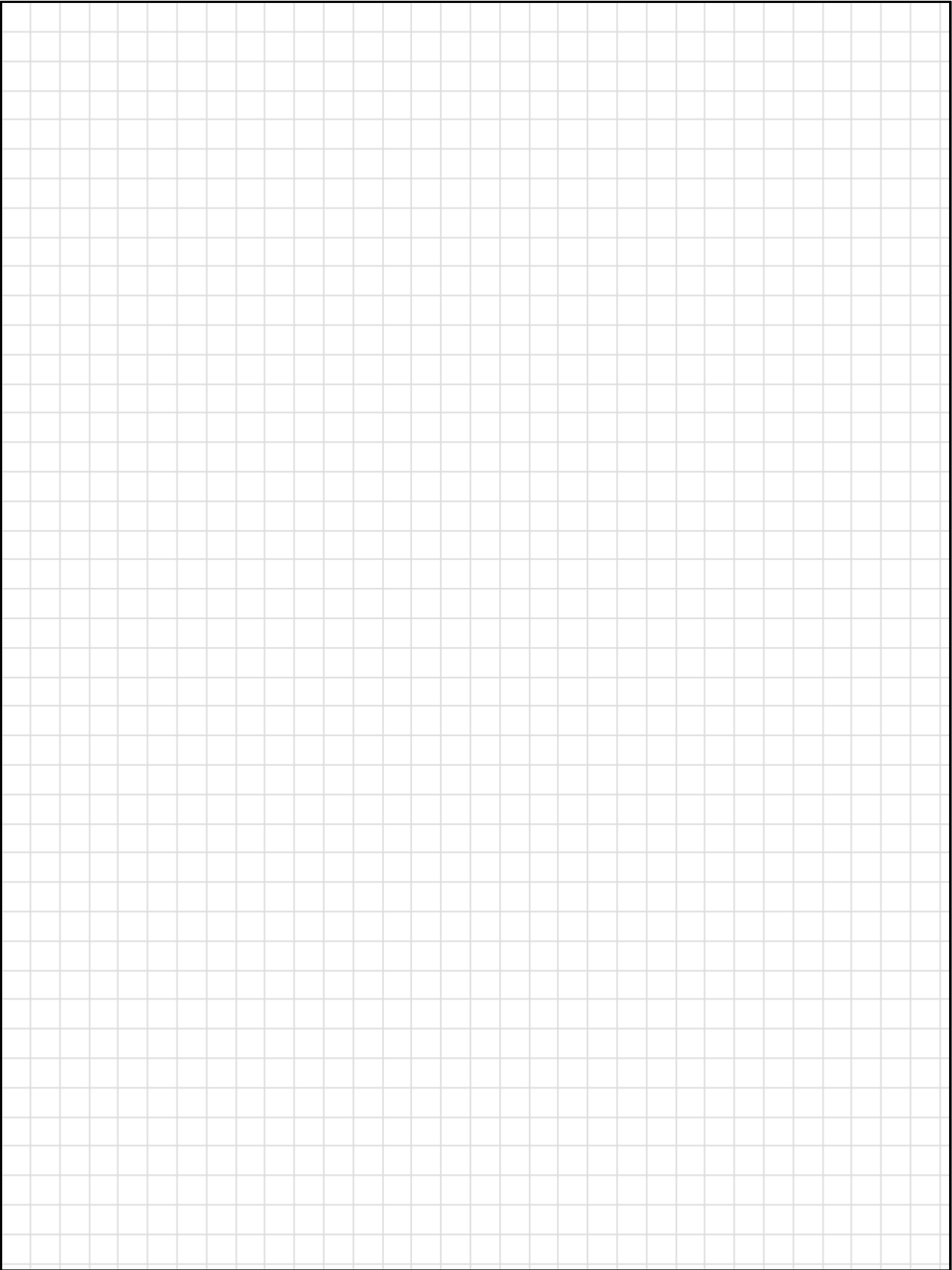
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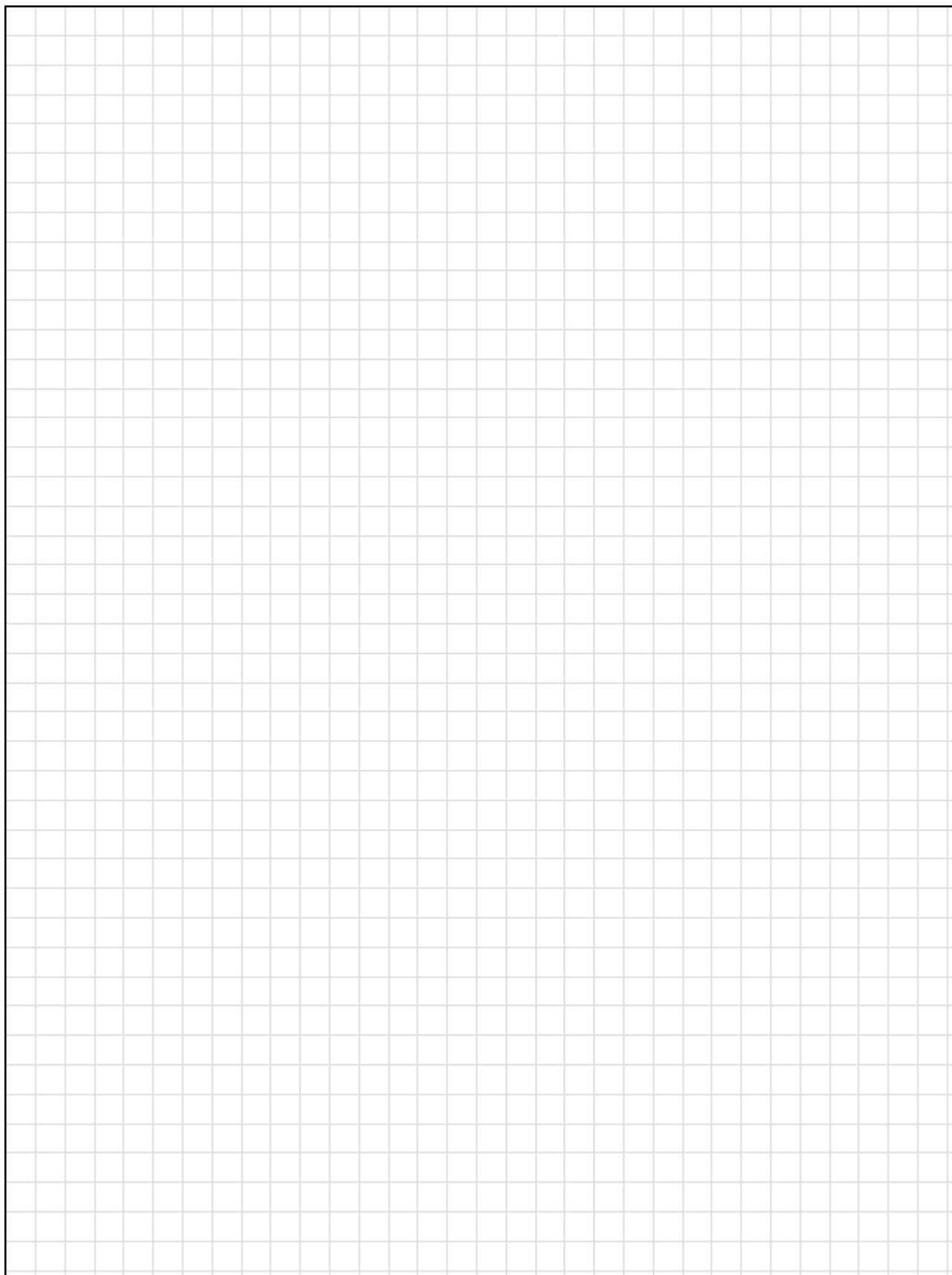
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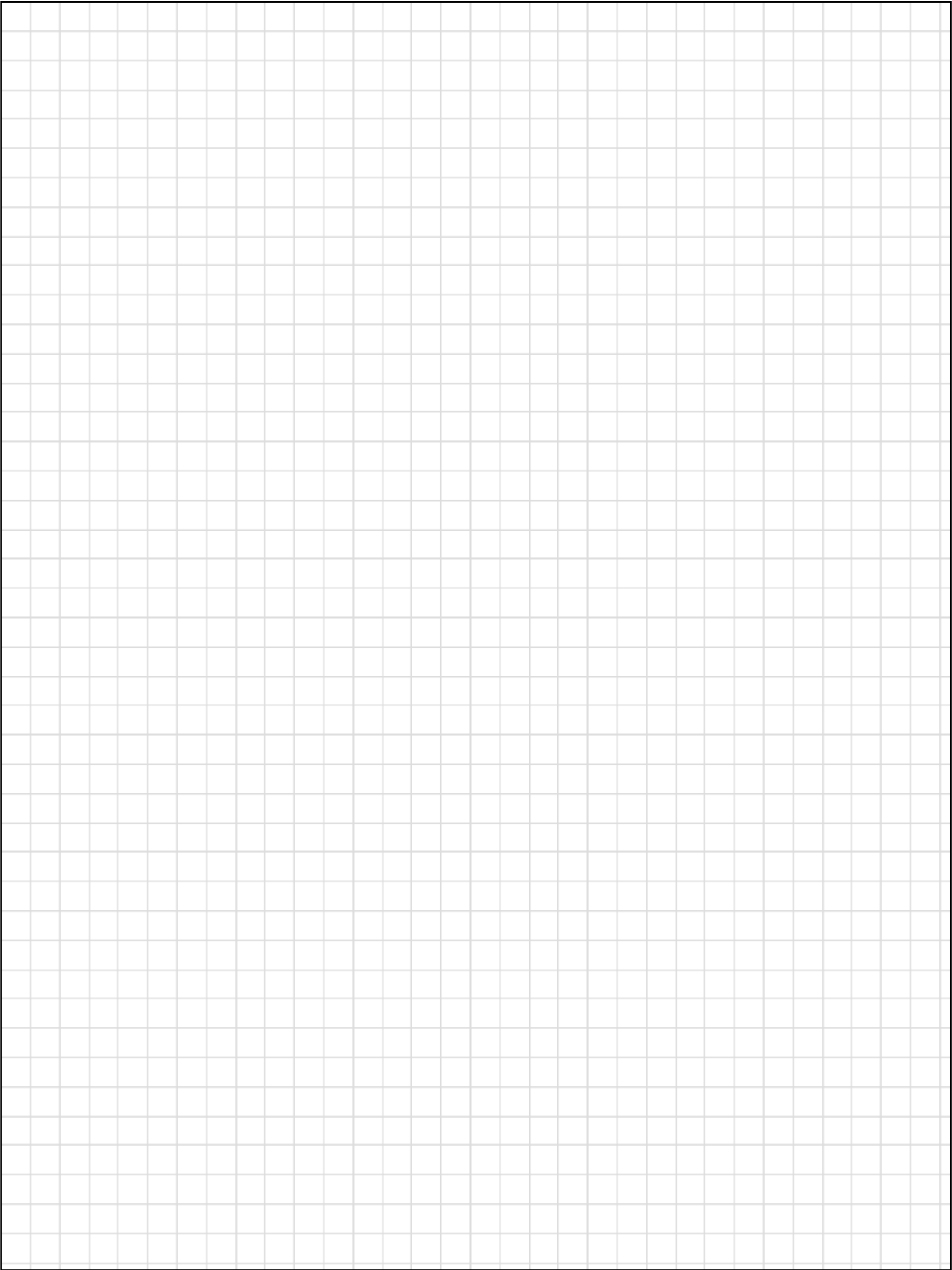
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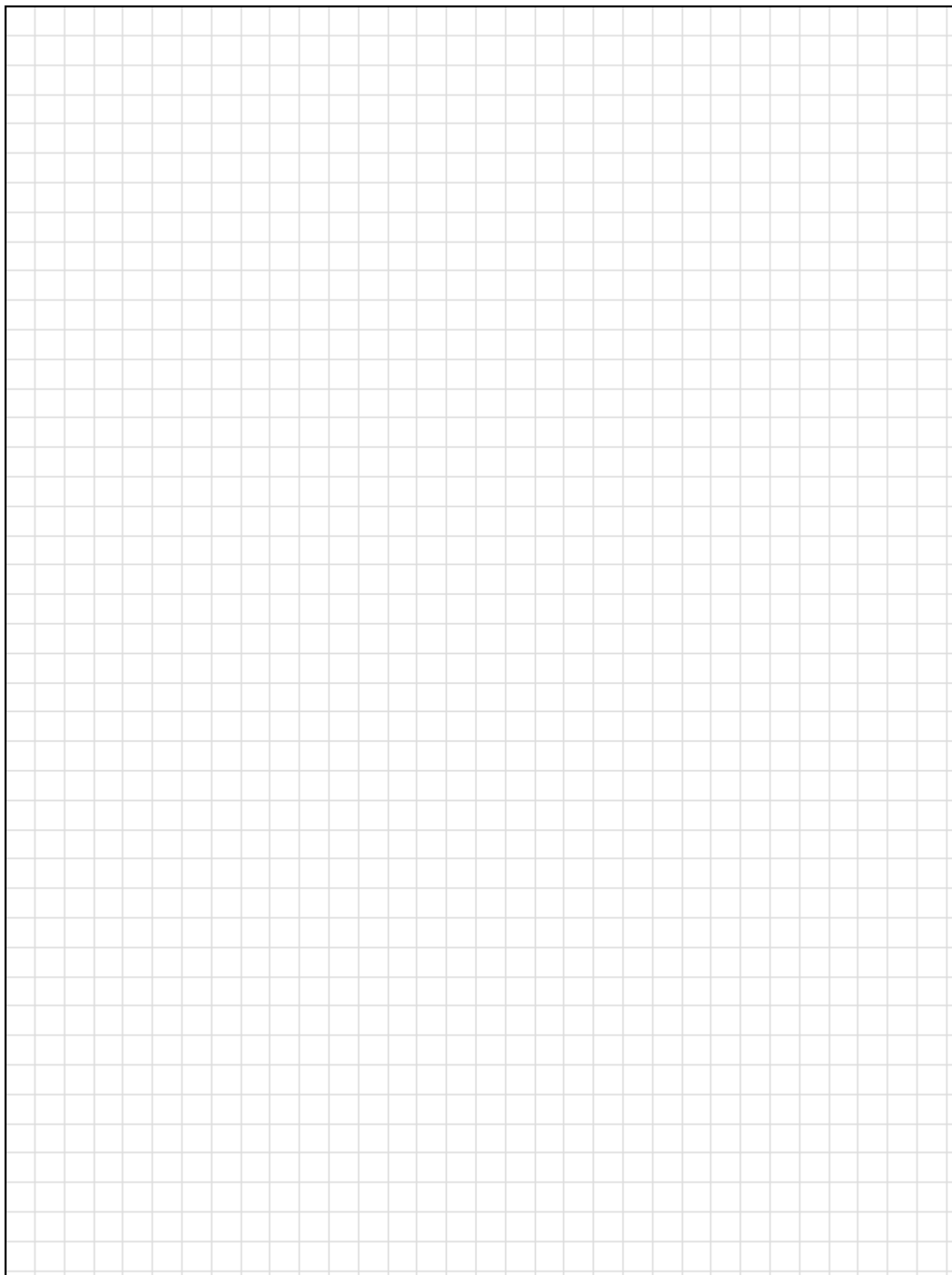
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User Notes



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